

Calculating Area

by. Man Lin and Julia

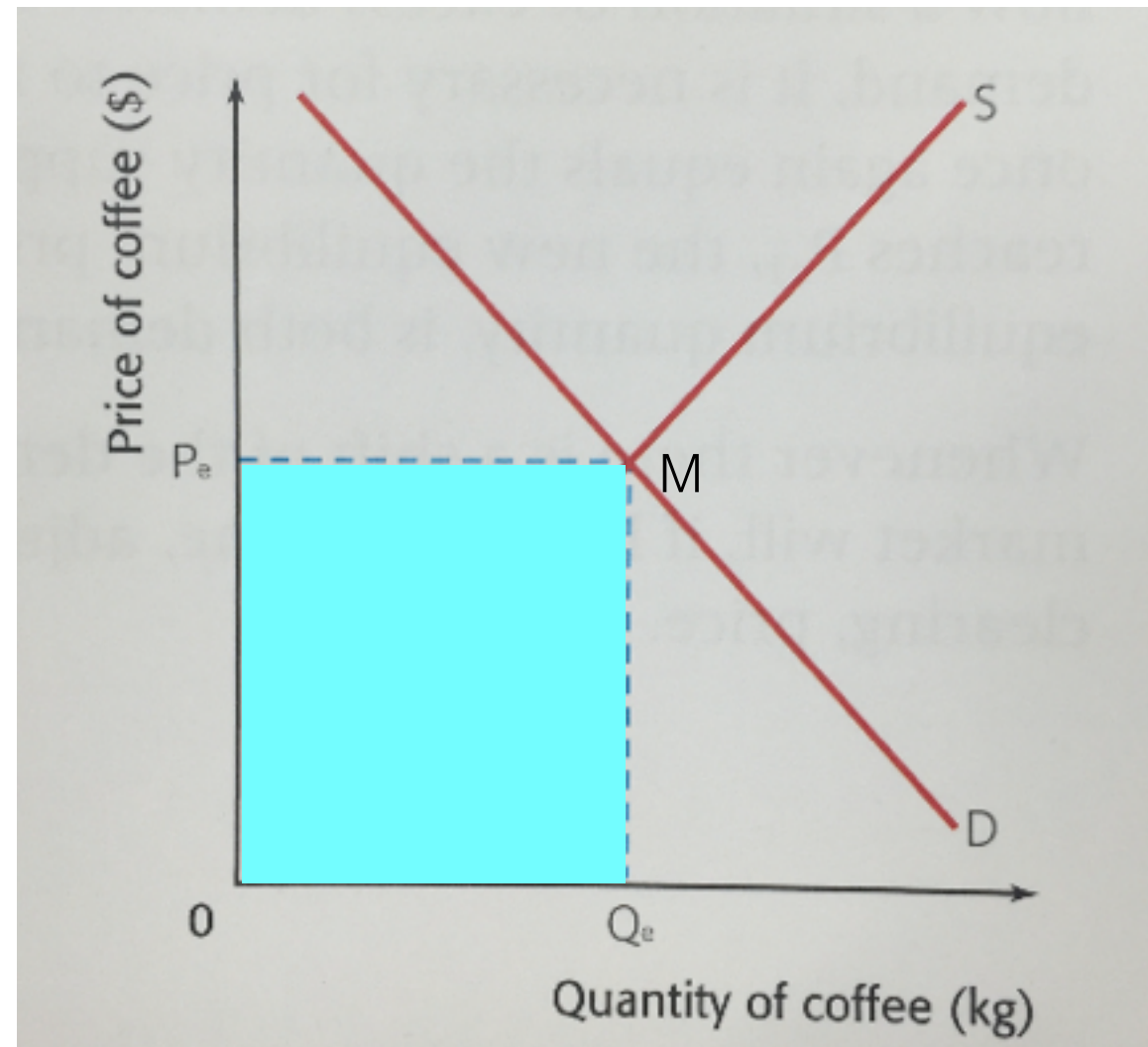



Rectangle

$$\textit{Area} = \textit{width} \times \textit{length}$$

Microeconomics

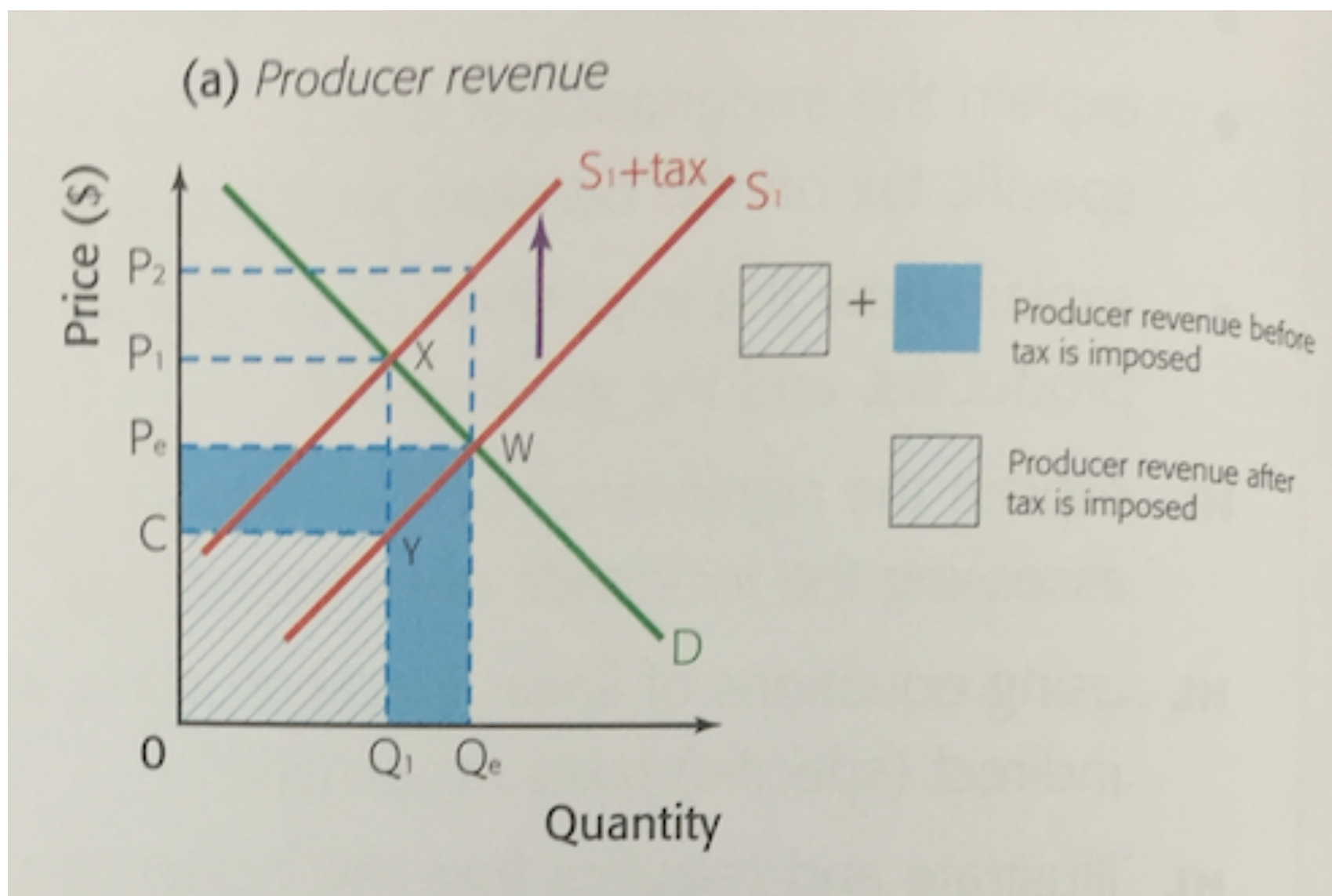
Total Revenue



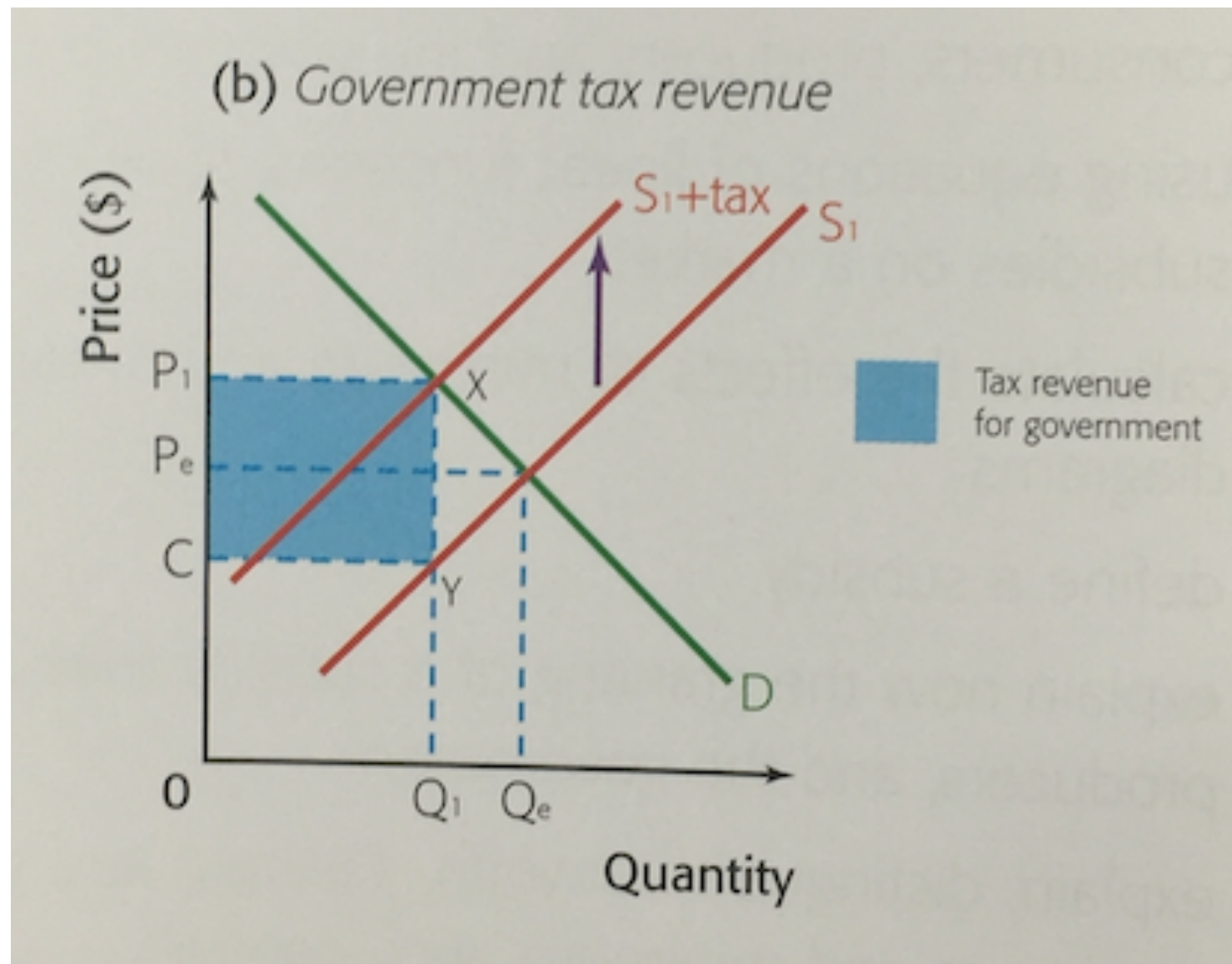
 $P_e, M, Q_e, 0 = \text{total revenue}$

$$\text{Area} = P_e \times Q_e$$

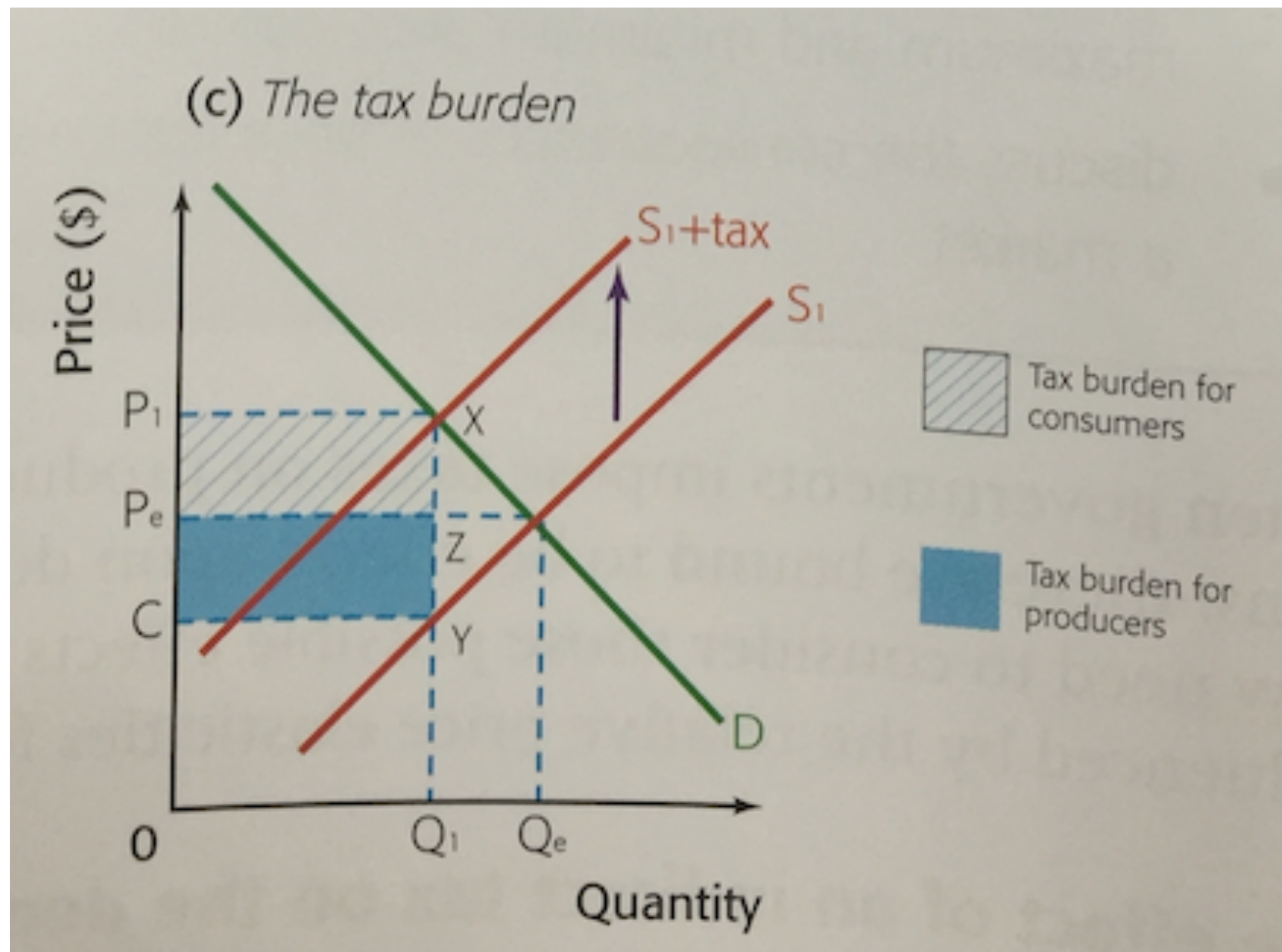
Indirect Taxes



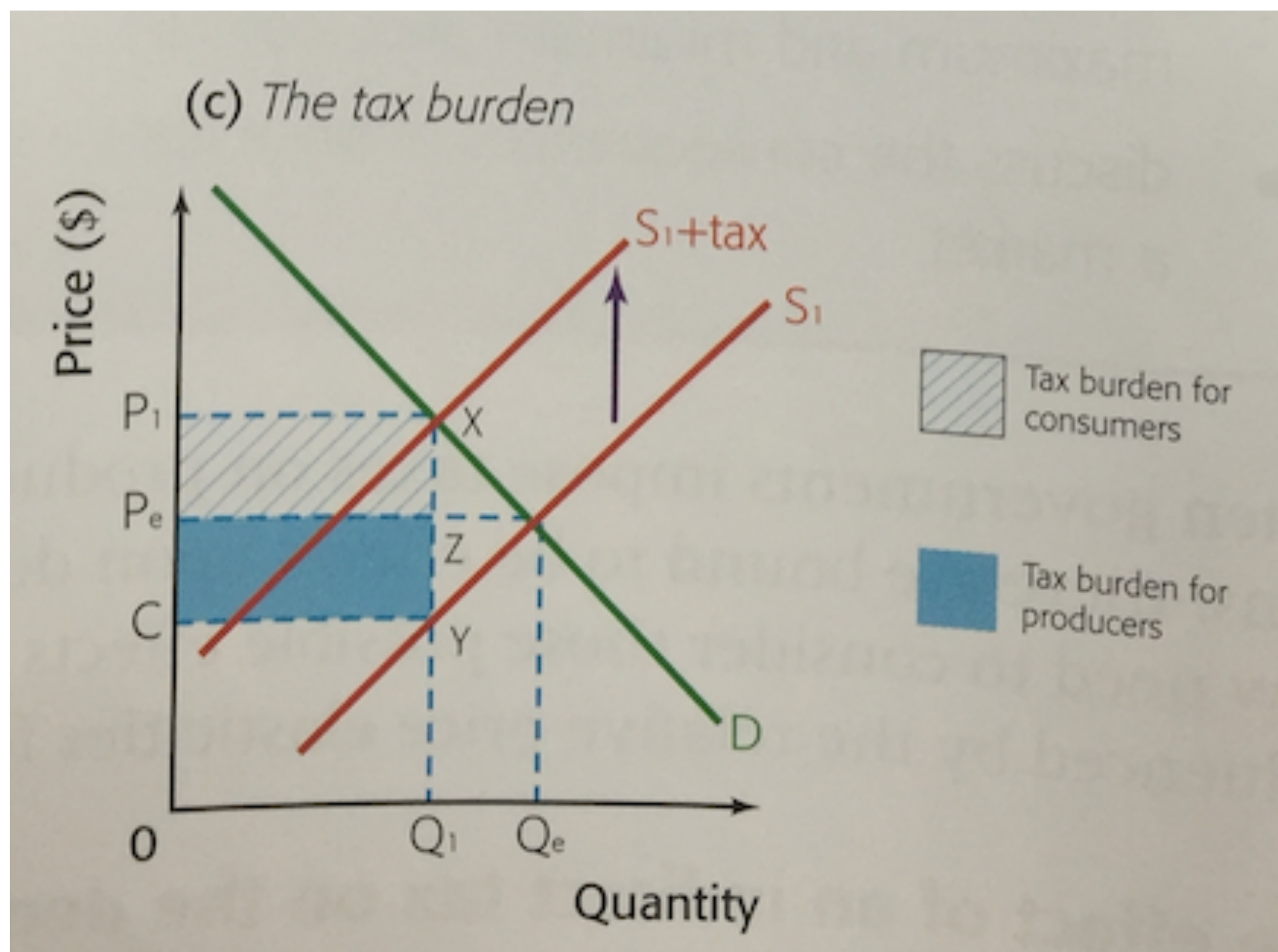
Indirect Taxes



Indirect Taxes



Indirect Taxes



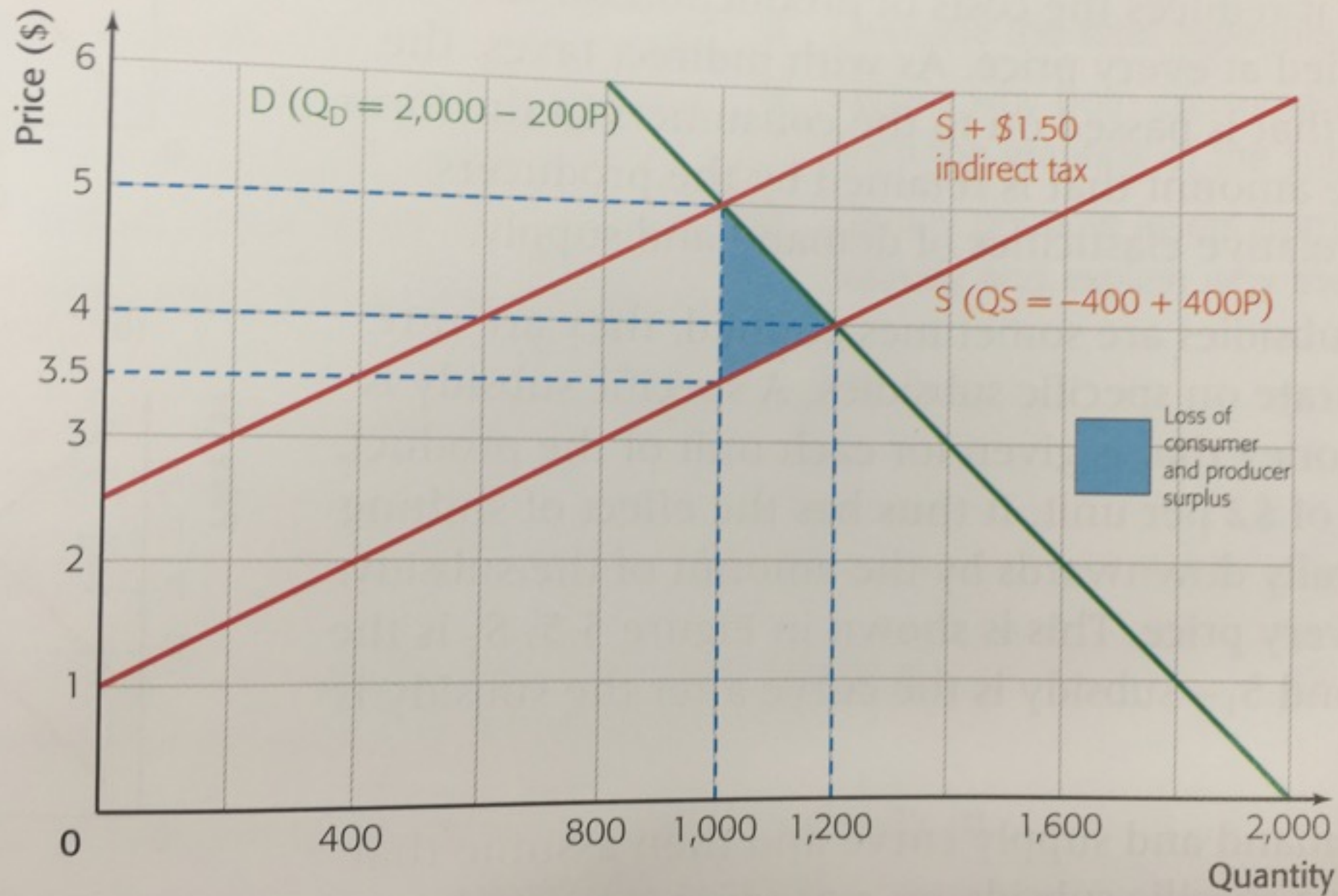
Applications of Concept

- Question #1: Let us assume that a product has the demand function and supply function shown below.
- $Q_d = 2000 - 200p$
- $Q_s = -400 + 400p$
- 1. Calculate the government revenue from the tax
- 2. Calculate the amount of tax paid by:
 - a) consumers
 - b) producers
- 3. Illustrate the area showing the loss of consumer and producer surplus.

Answers

- 1. $\$1.50 \times 1000 \text{ units} = \1500
- 2.
 - a) $\$1.00 \times 1000 \text{ units} = \1000
 - b) $\$0.50 \times 1000 \text{ units} = \500

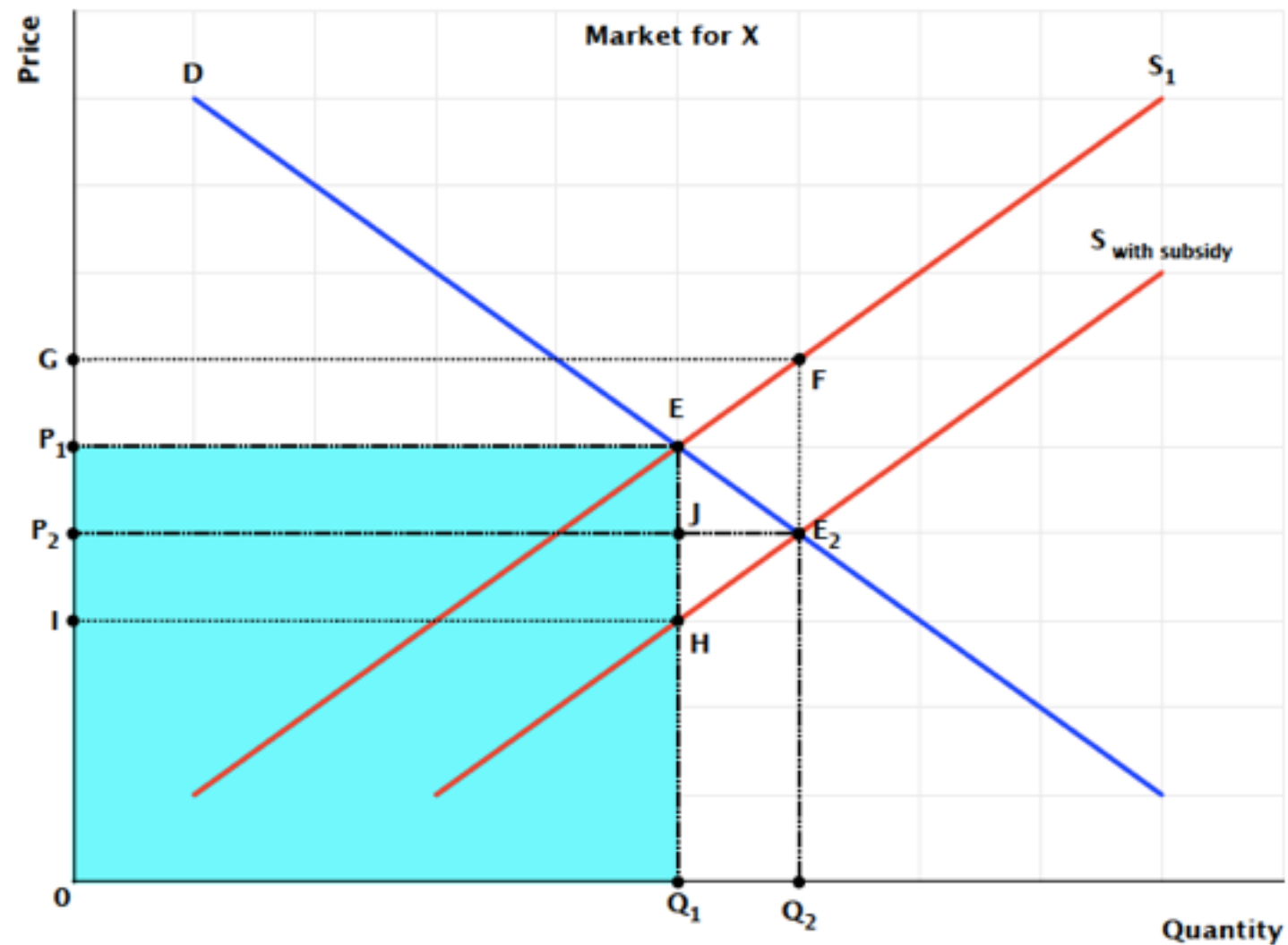
price
quantity bought and sold.



nd quantity bought and sold are

The amount of tax paid by the producers is

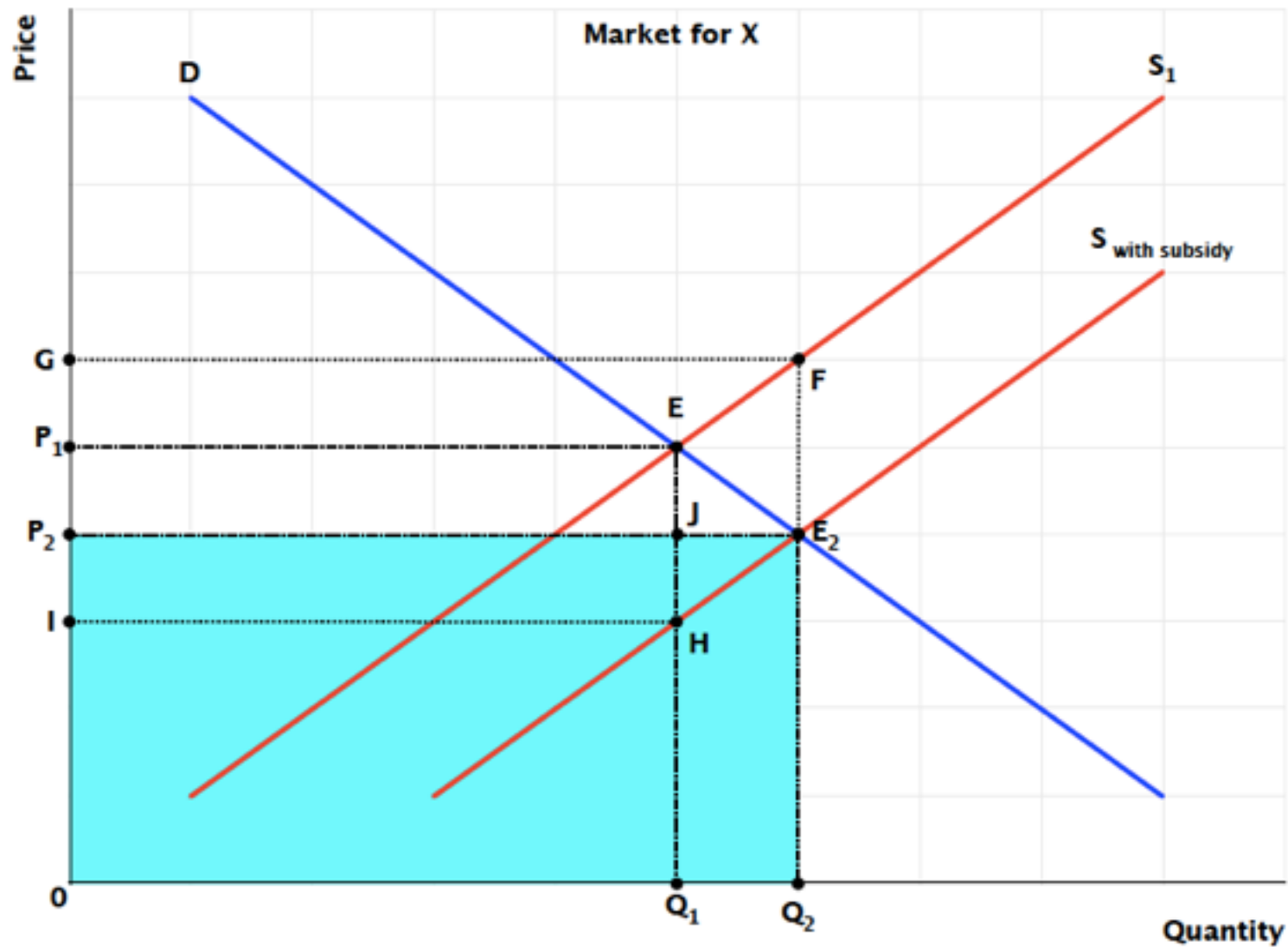
Subsidy



$P_1, E, Q_1, 0$ = total consumer expenditure before subsidy

$$\text{Area} = P_1 \times Q_1$$

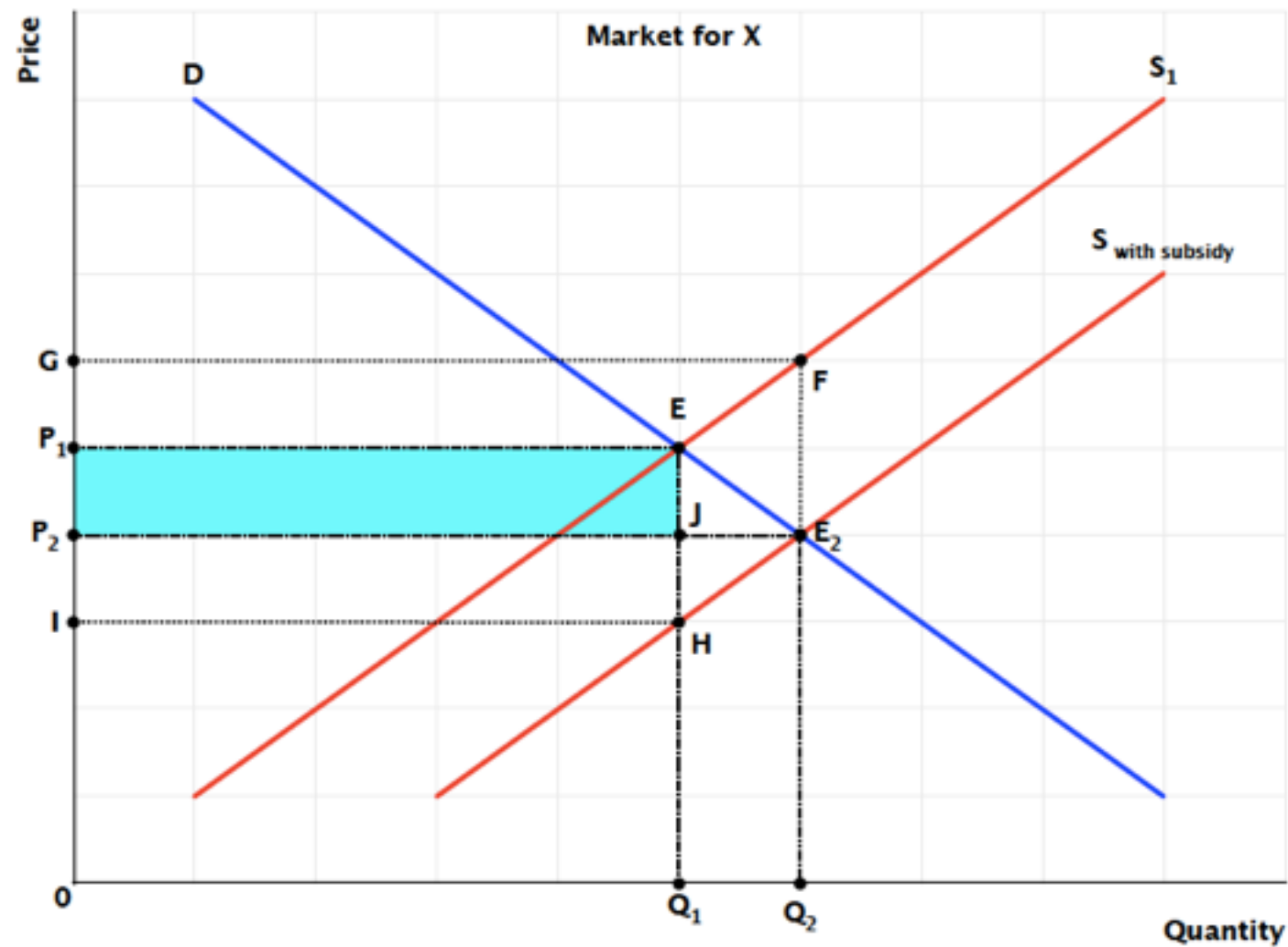
Subsidy



$P_2, E_2, Q_2, 0$ = total consumer expenditure after subsidy

$$\text{Area} = P_2 \times Q_2$$

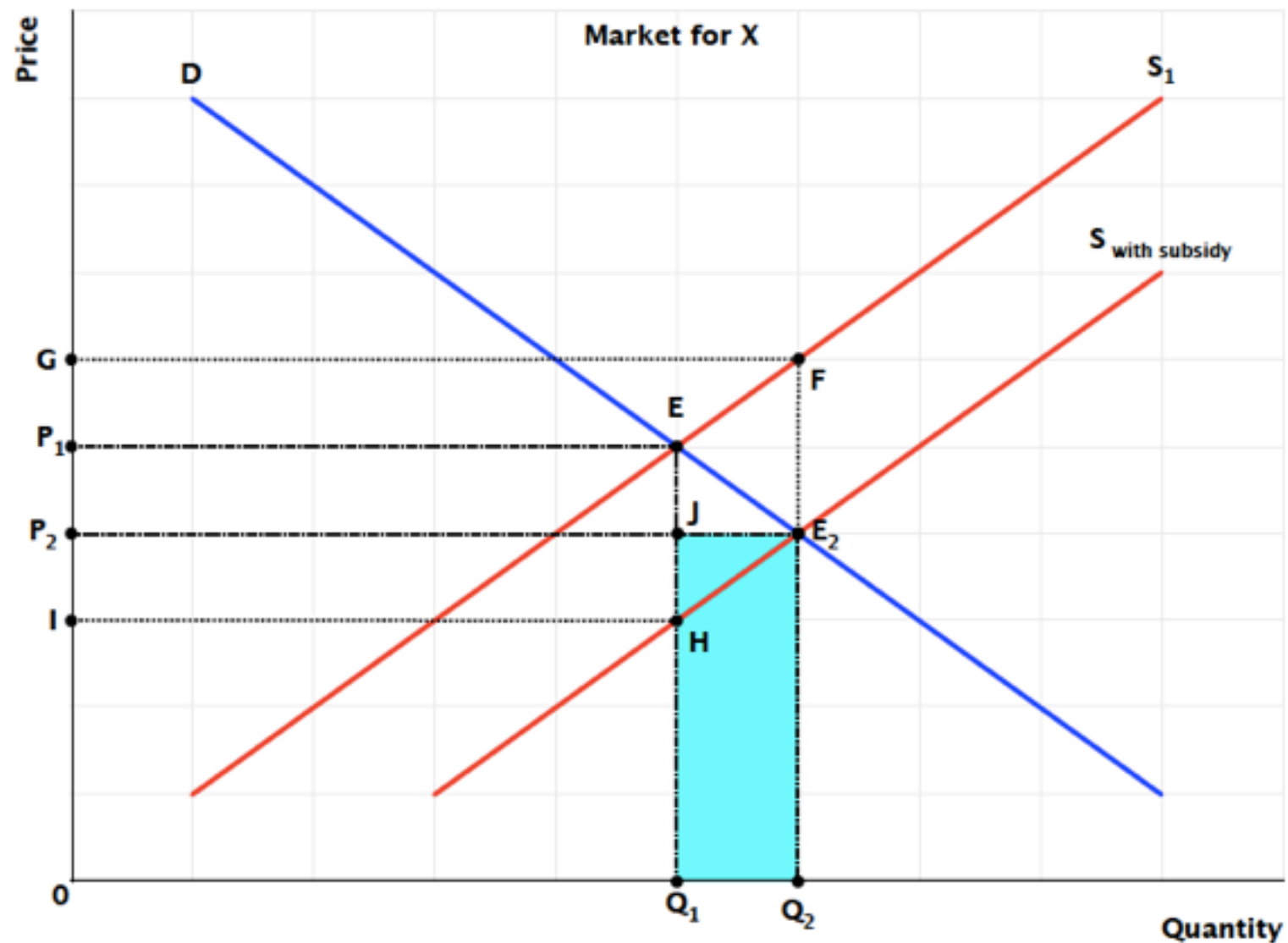
Subsidy



P₁, E, J, P₂ = decrease in consumer expenditure after subsidy

$$\text{Area} = (P_1 - P_2) \times Q_1$$

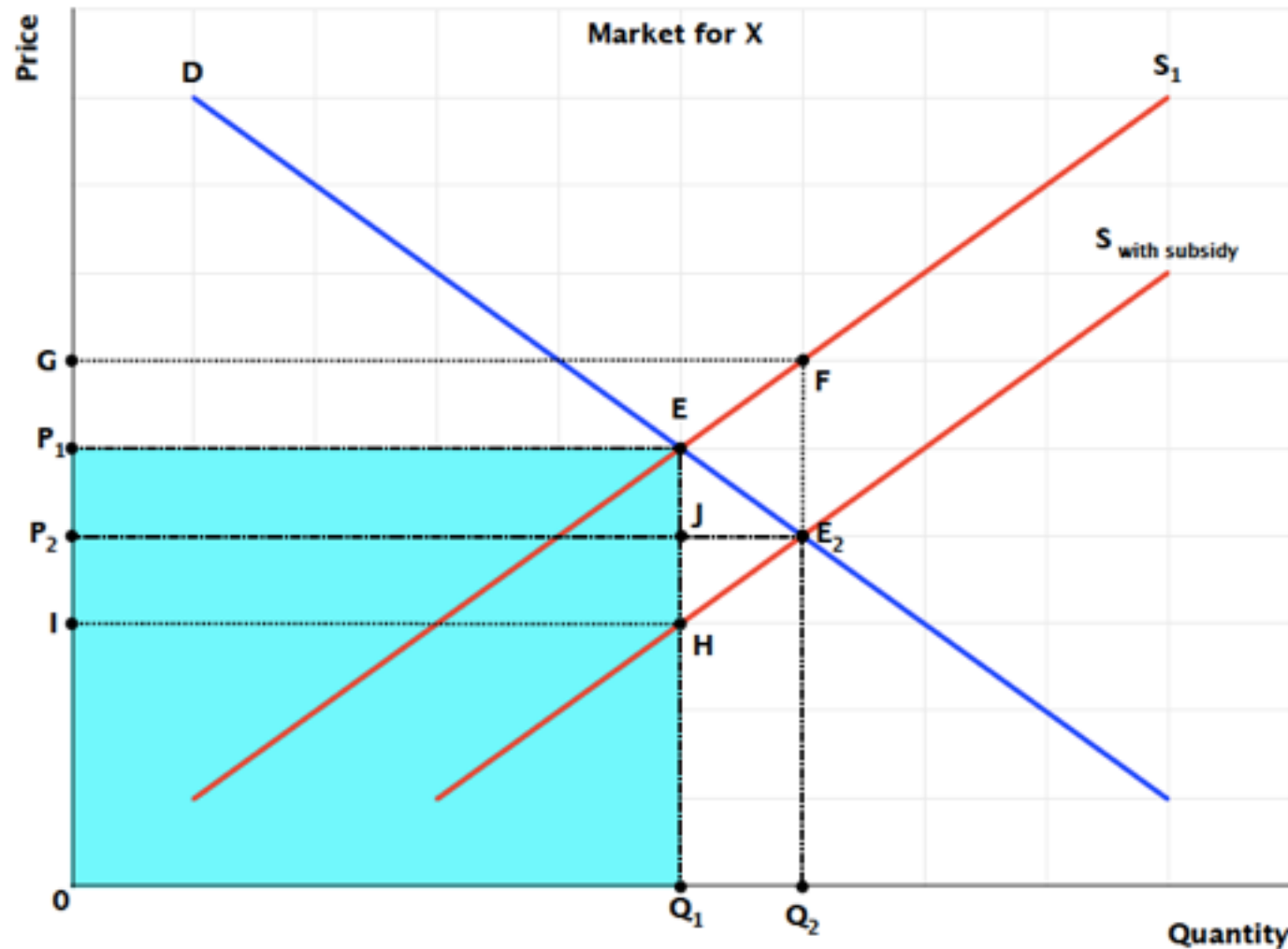
Subsidy



J, E₂, Q₂, Q₁ = increase in consumer expenditure after subsidy

$$\text{Area} = (Q_2 - Q_1) \times P_2$$

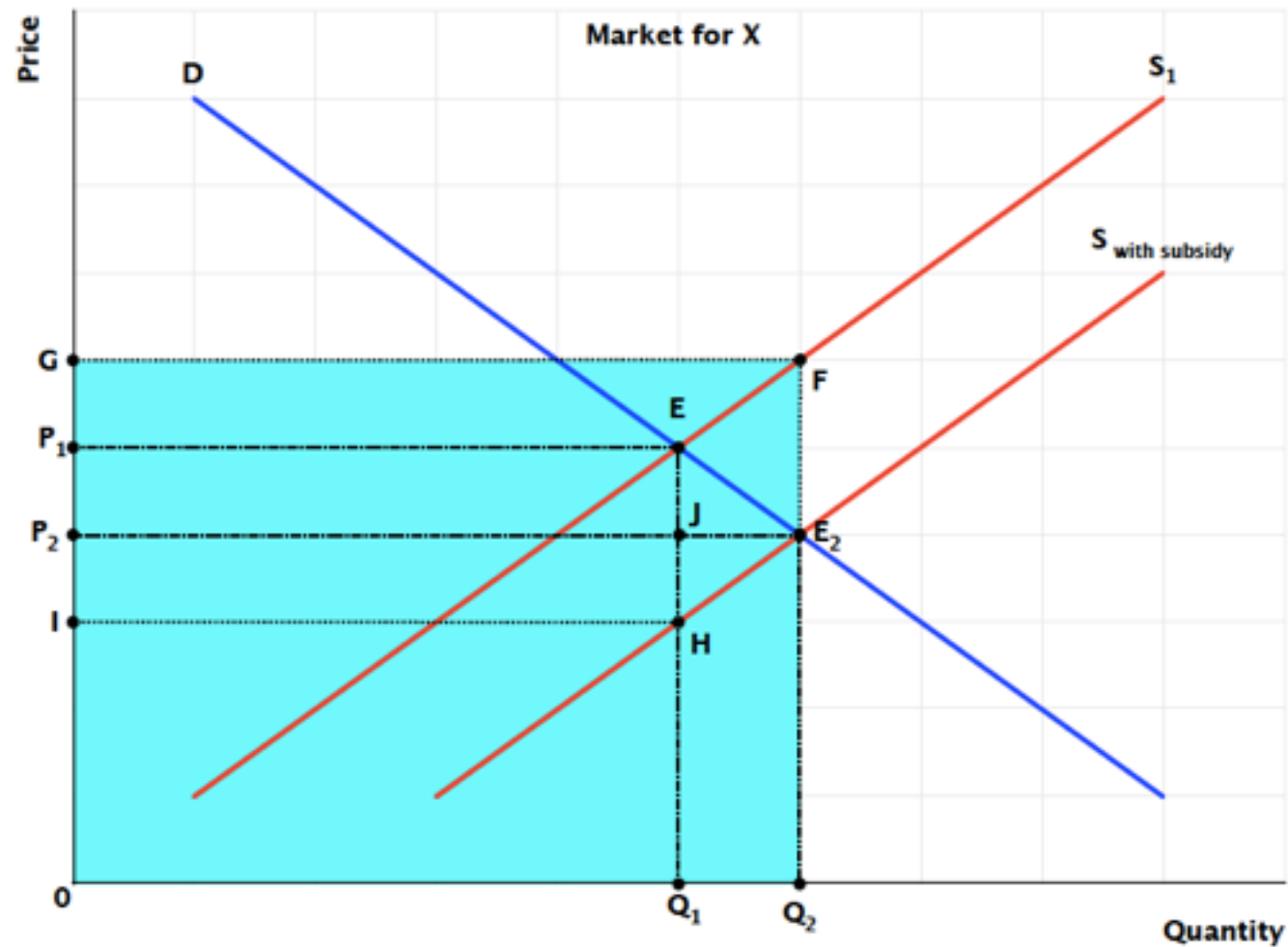
Subsidy



$P_1, E, Q_1, 0$ = total revenue before subsidy

$$Area = Q_1 \times P_1$$

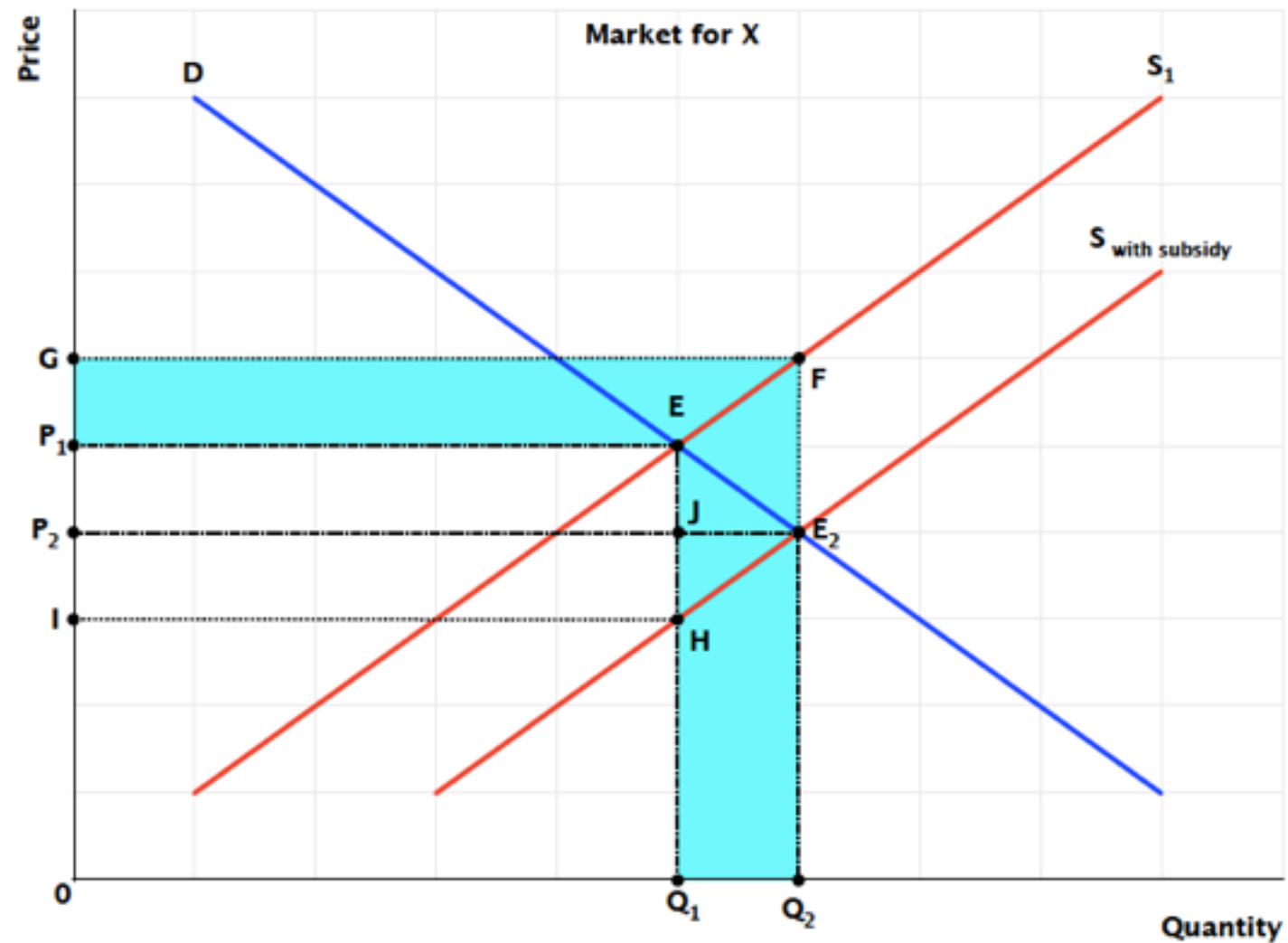
Subsidy



$G, F, Q_2, 0$ = total revenue after subsidy

$$\text{Area} = Q_2 \times G$$

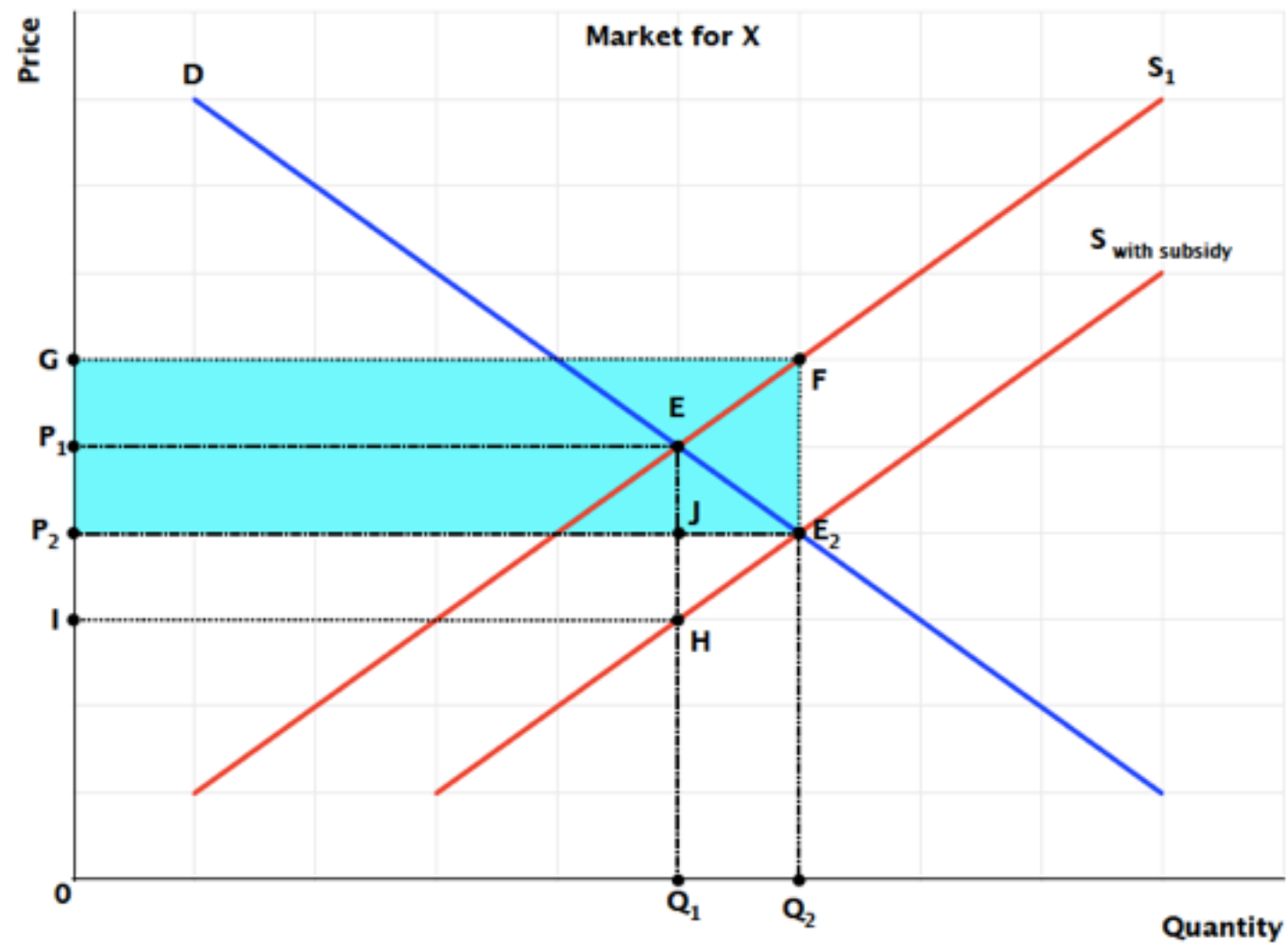
Subsidy



G, F, Q_2 , Q_1 , E, P_1 = change in total revenue after subsidy

$$\text{Area} = (Q_2 \times G) - (Q_1 \times P_1)$$

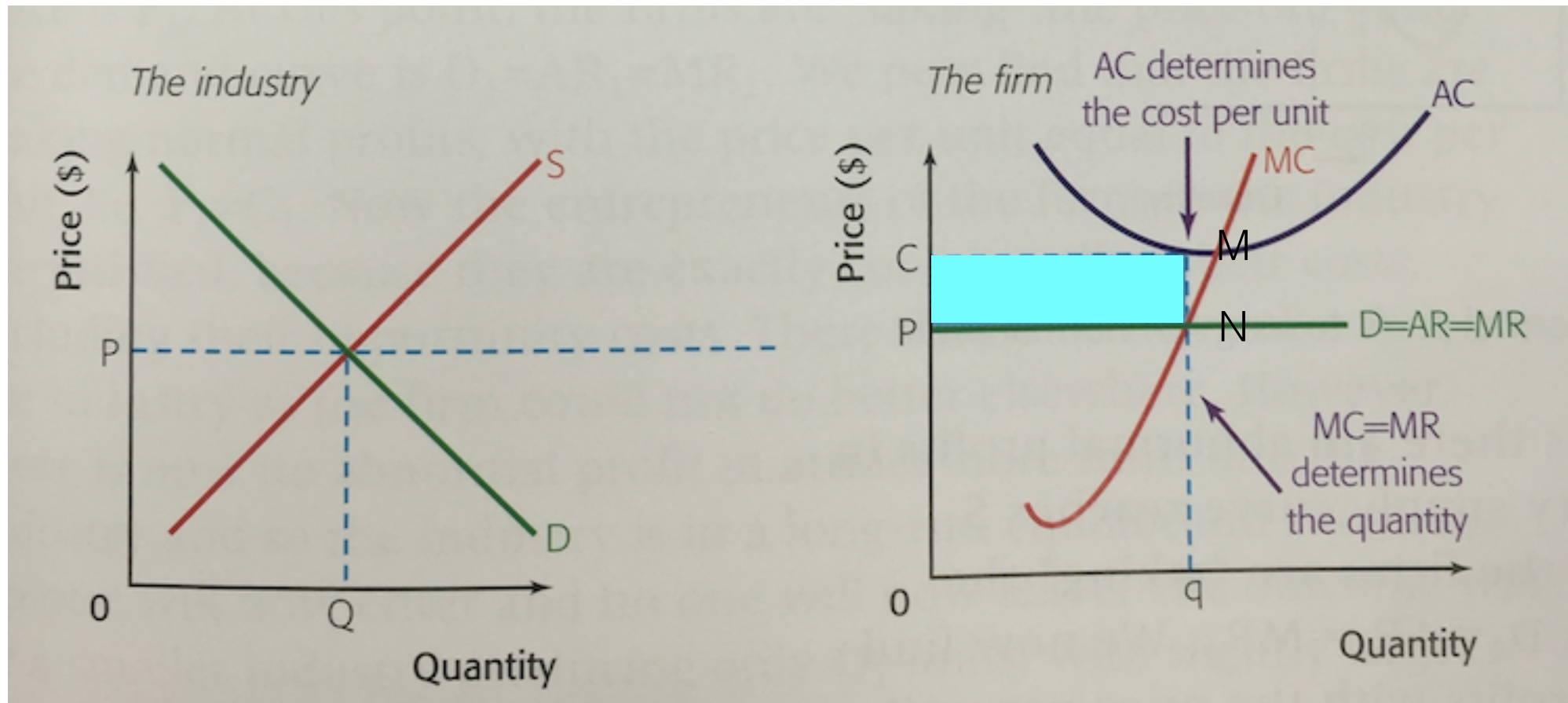
Subsidy



G, F, E₂, P₂ = total subsidy paid by the government

$$\text{Area} = (G - P_2) \times Q_2$$

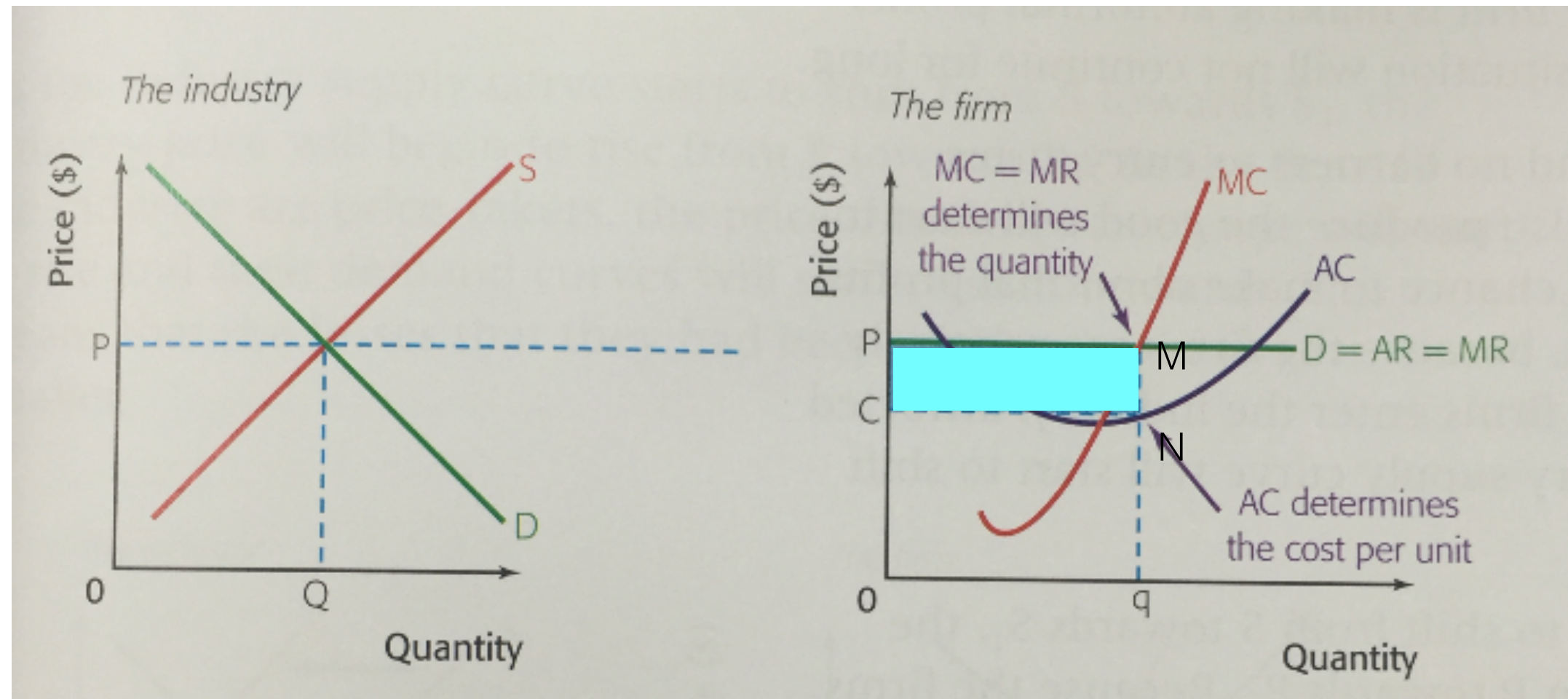
Perfect Competition




C, M, N, P = losses

$$\text{Area} = (C - P) \times q$$

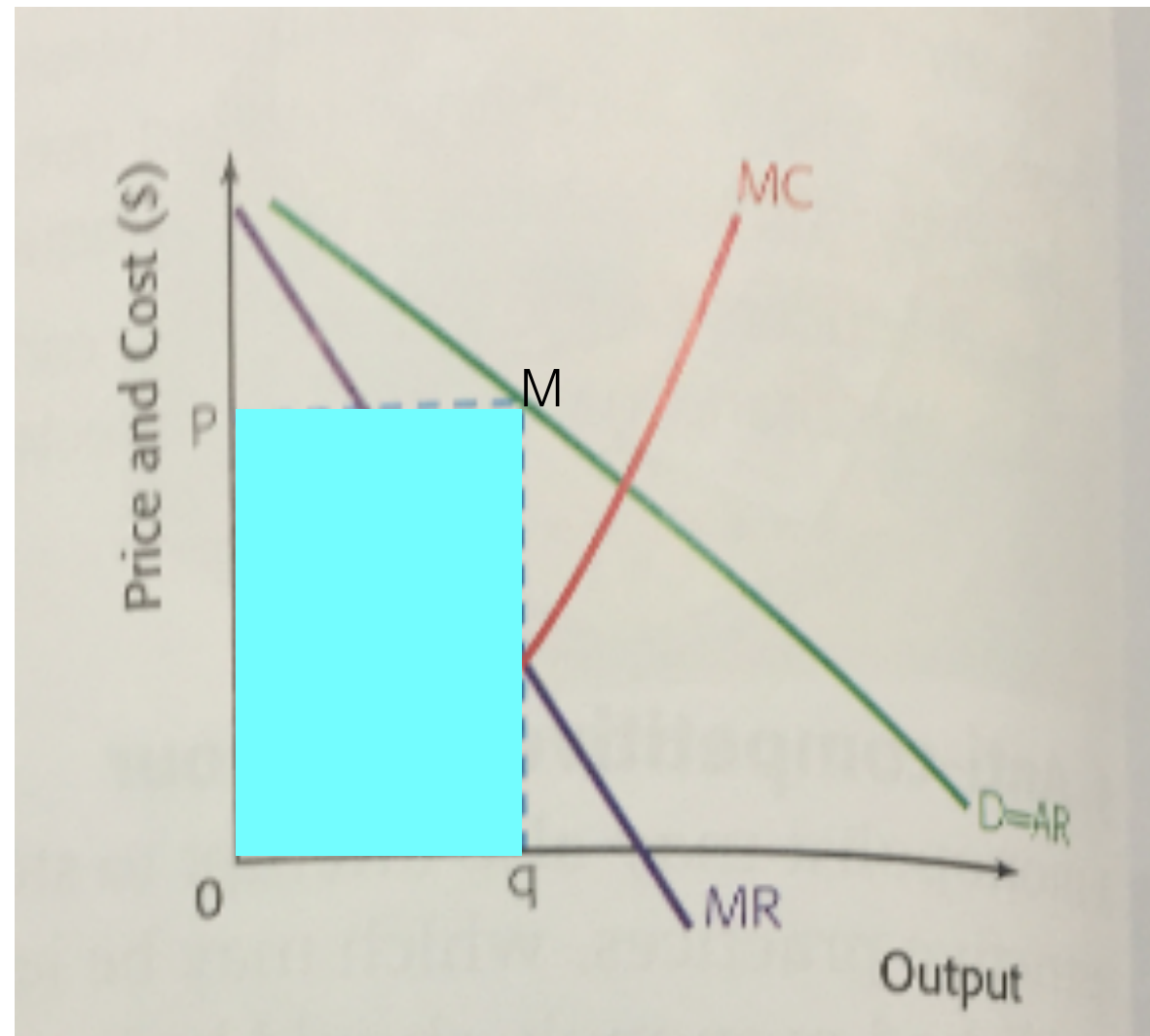
Perfect Competition




 P, M, N, C = abnormal profits

$$\text{Area} = (P - C) \times q$$

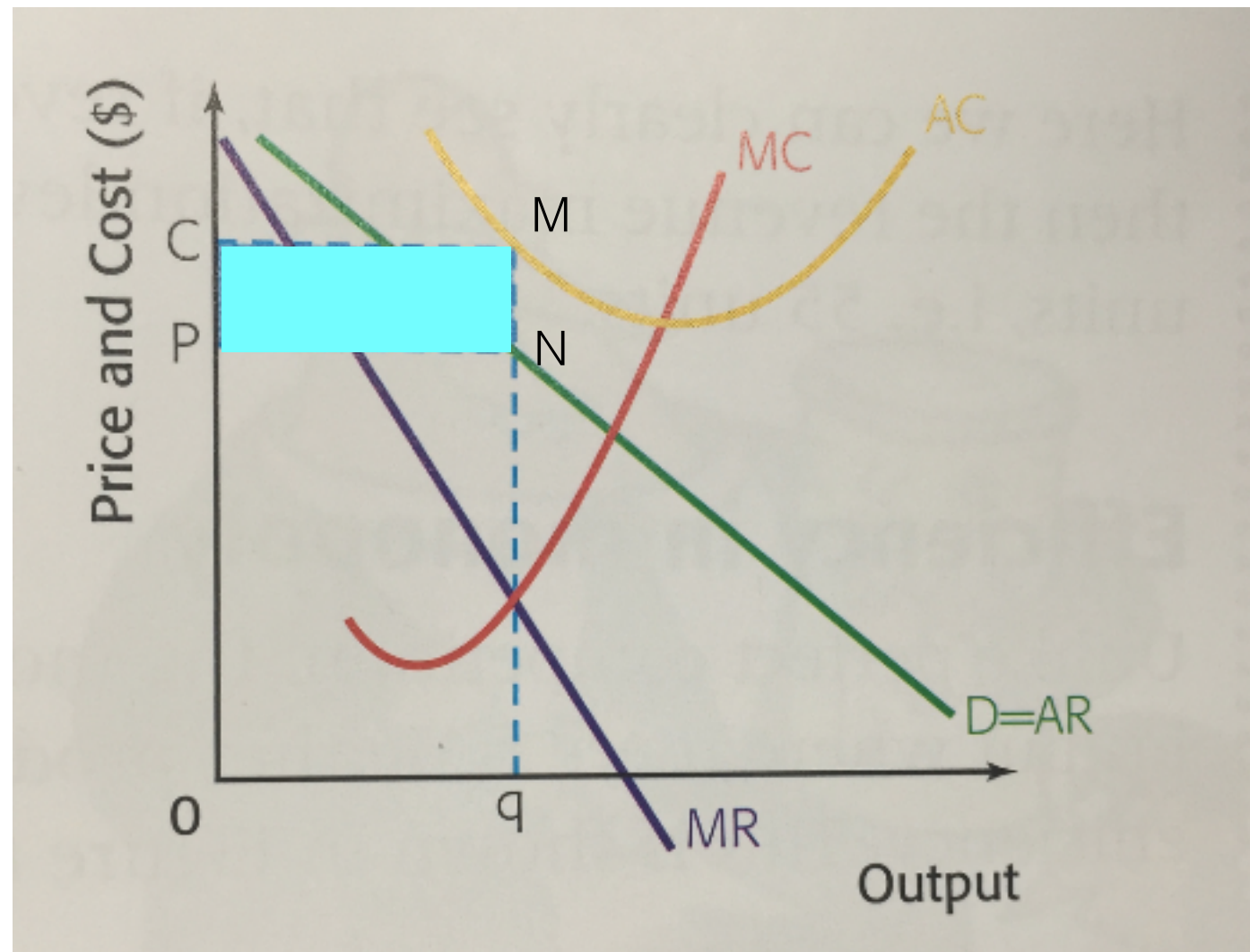
Total Revenue



 P, M, q, 0 = total revenue

$$\text{Area} = p \times q$$

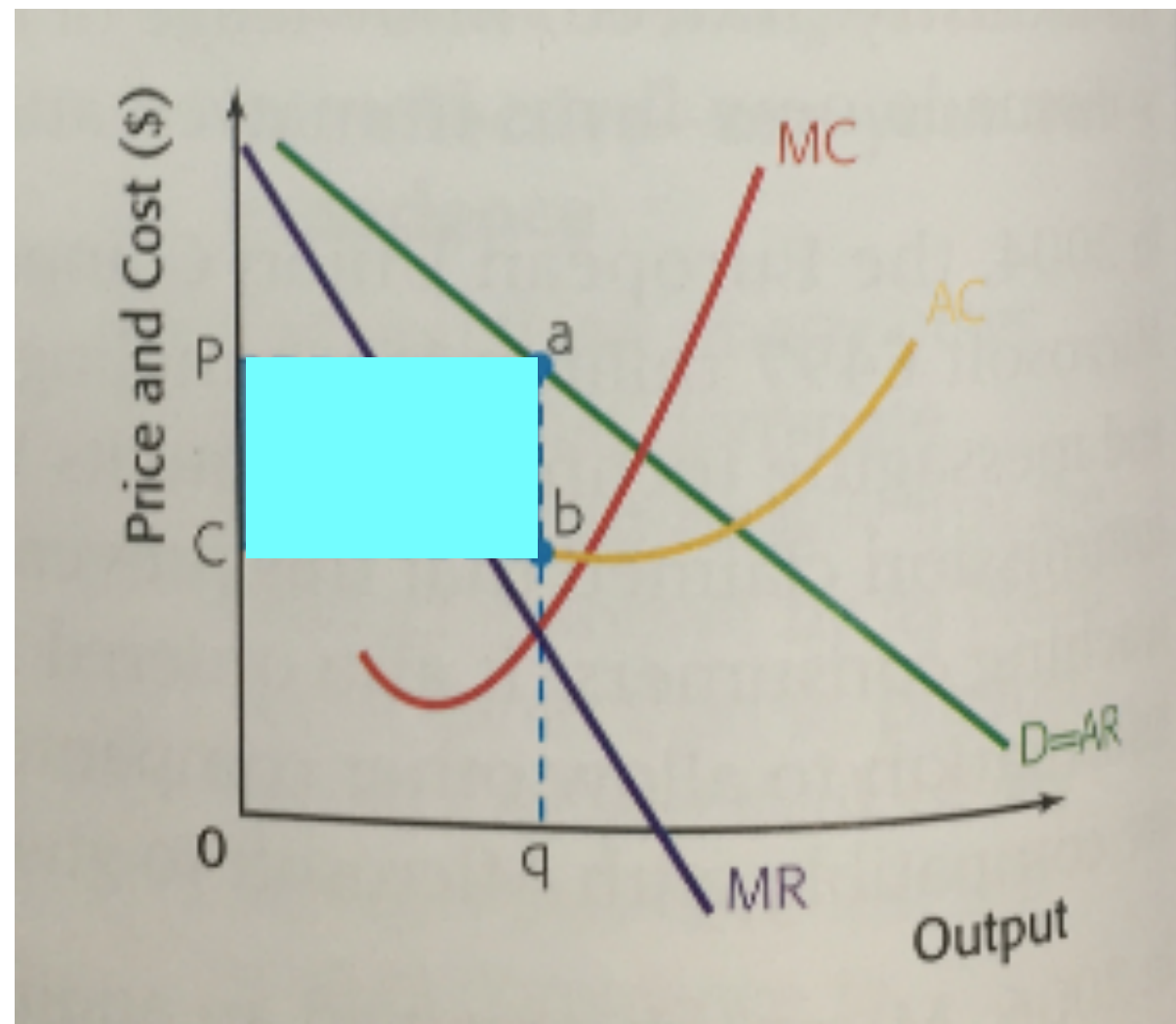
Monopoly



C, M, N, P = losses

$$Area = (C - P) \times q$$

Monopoly

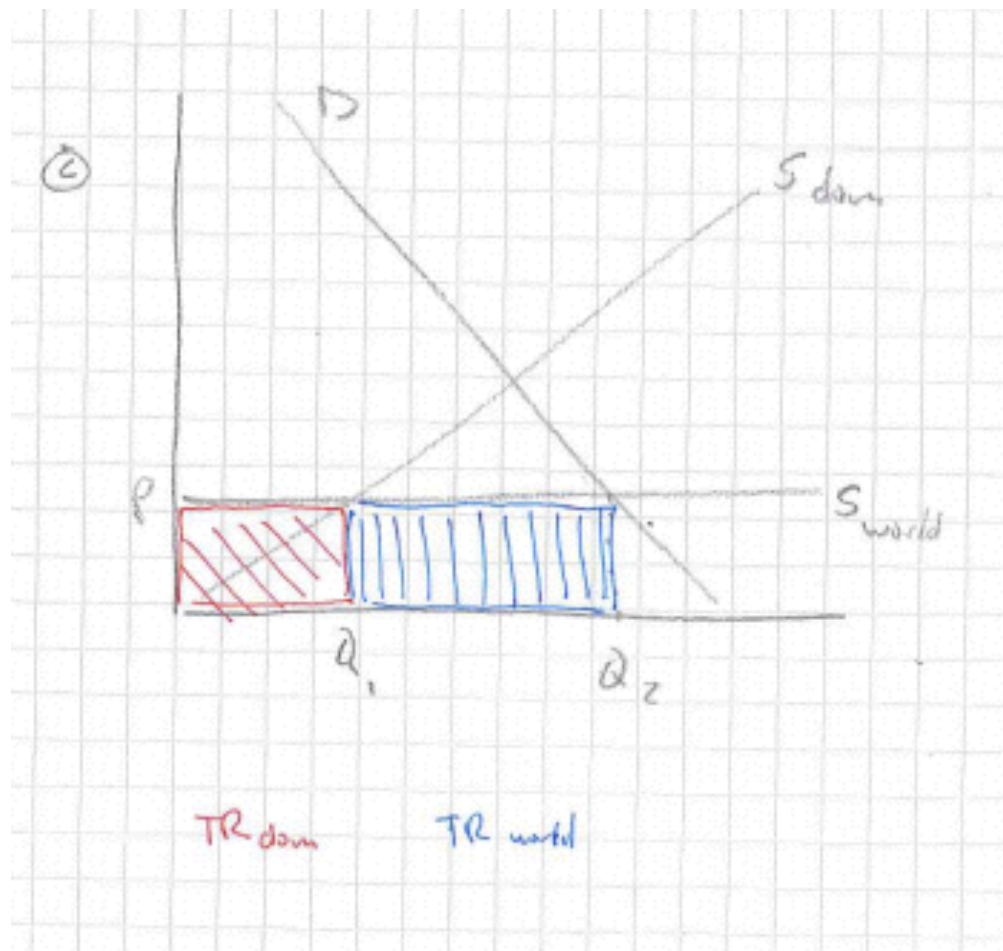


P, a, b, C = abnormal profit

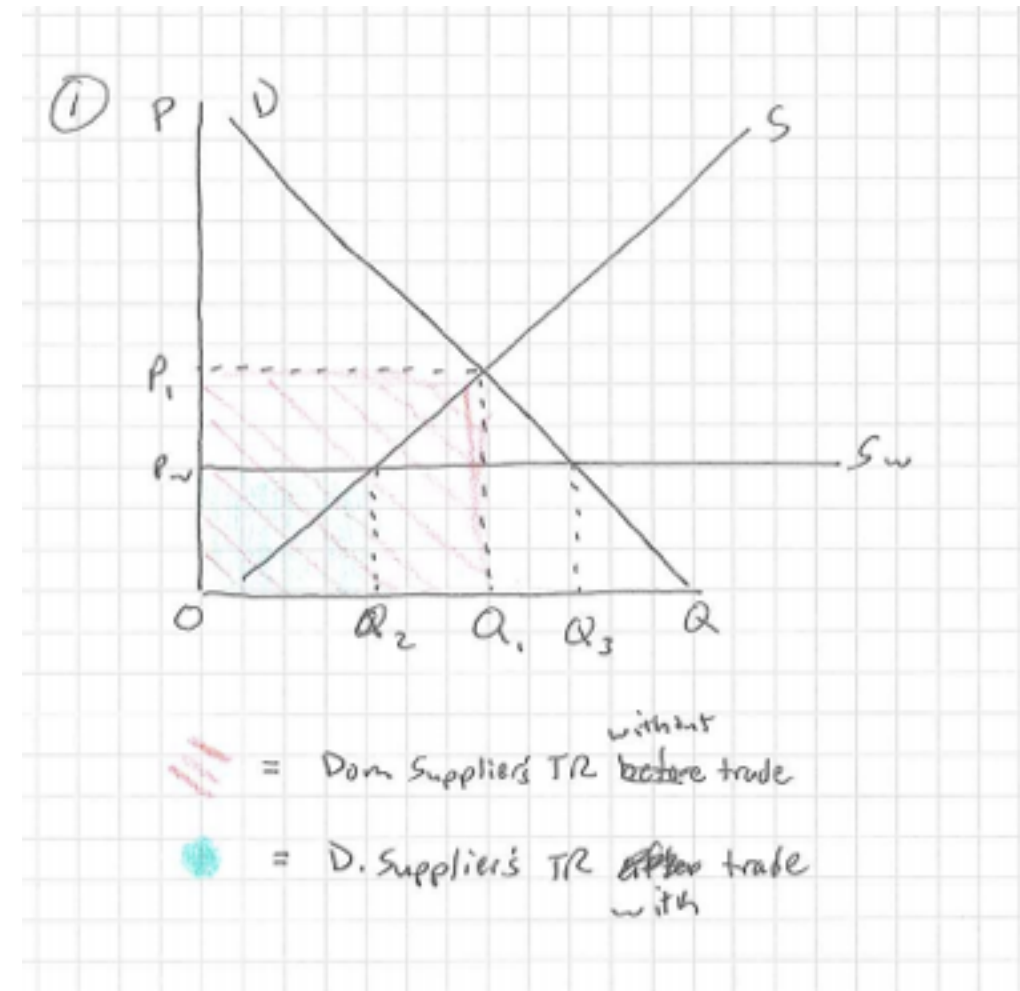
$$\text{Area} = (P - C) \times q$$

International Trade

International Economics: Free Trade

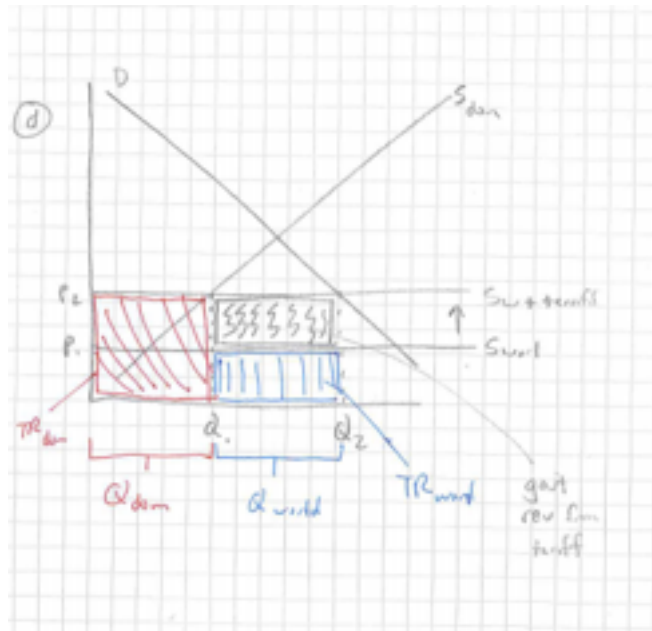


1. Domestic TR
2. World (foreign) TR

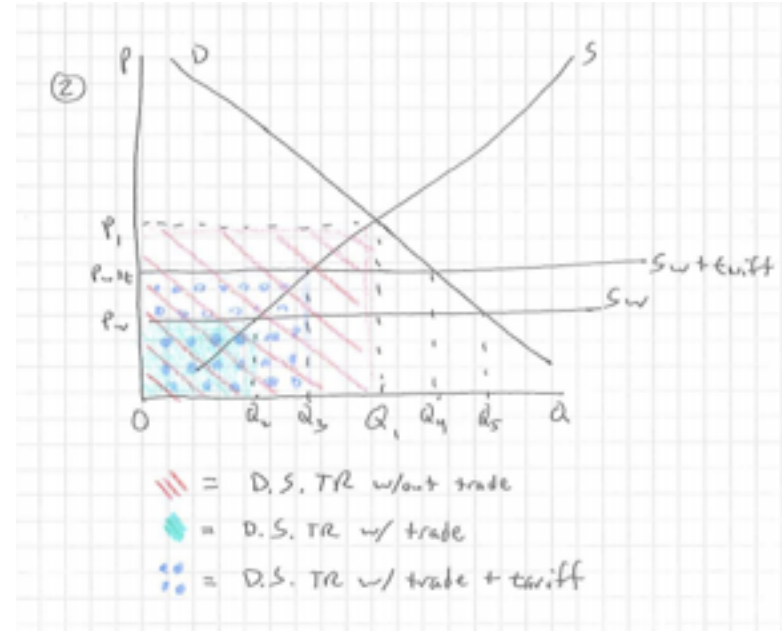


1. Domestic TR before trade
2. Domestic TR after trade

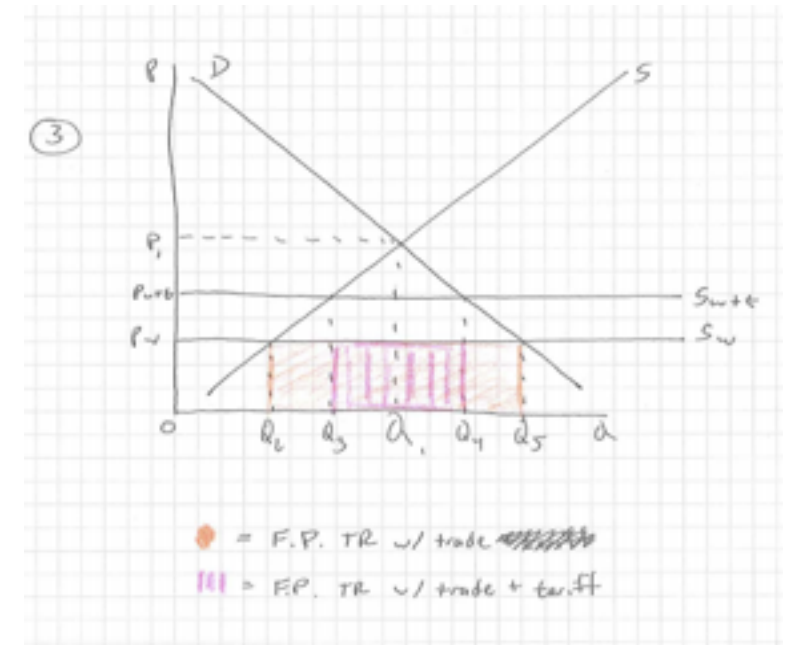
International Economics: Tariffs



1. Domestic TR
2. World (foreign) TR
3. Government Revenue

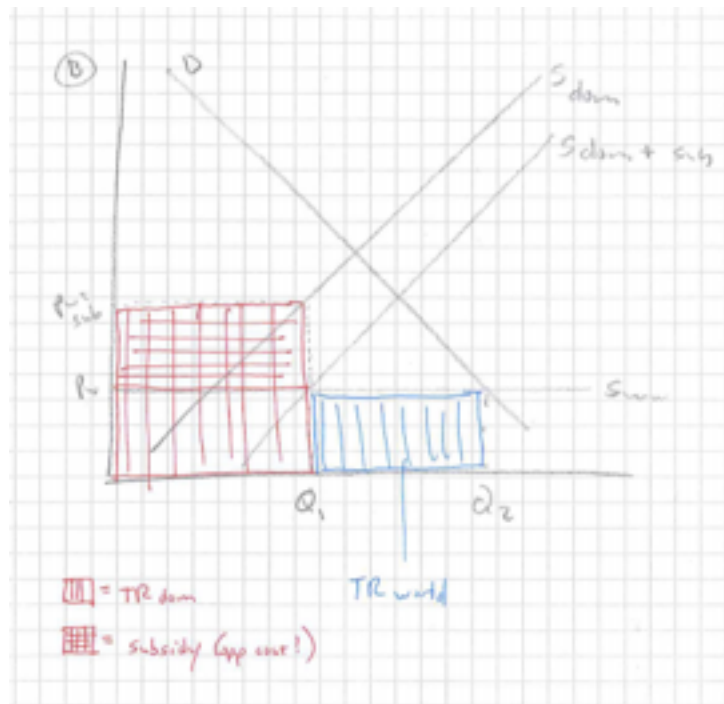


1. Domestic TR without trade
2. Domestic TR with trade
3. Domestic TR with trade and tariff

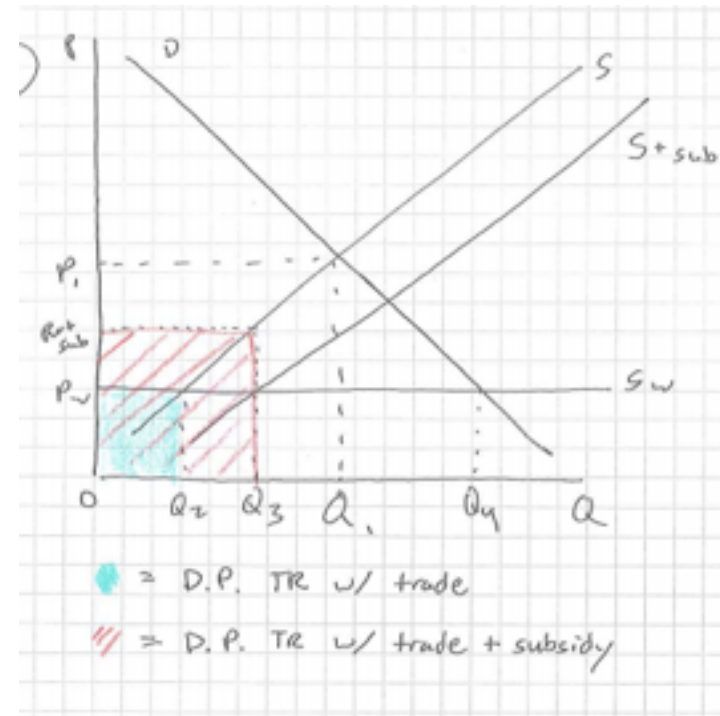


1. Foreign TR with trade
2. Foreign TR with trade and tariff

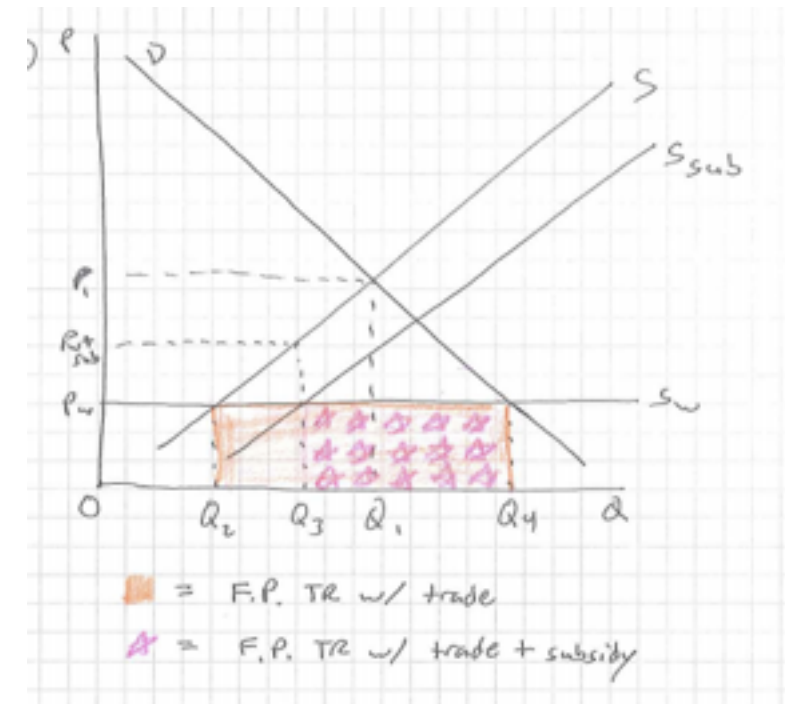
International Economics: Subsidies



1. Domestic TR
2. Amount of Subsidy
3. World (foreign) TR

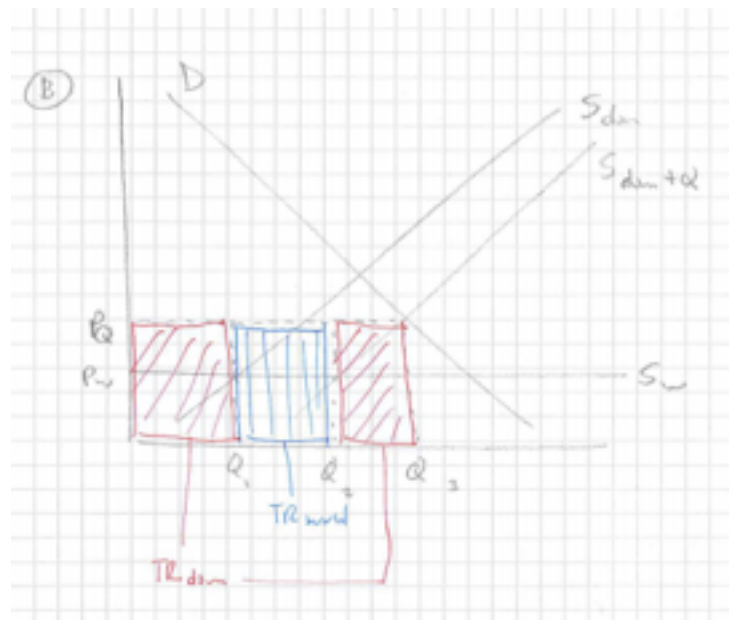


1. Domestic TR with trade
2. Domestic TR with trade and subsidy

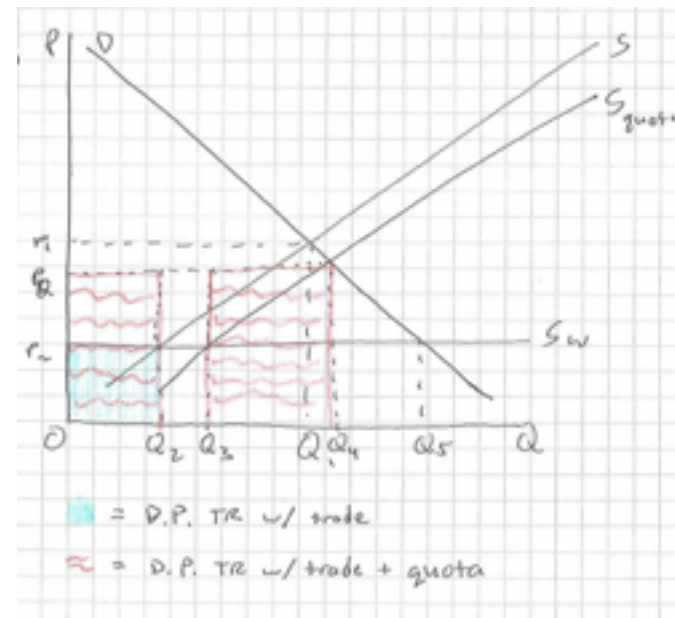


1. Foreign TR with trade
2. Foreign TR with trade and subsidy

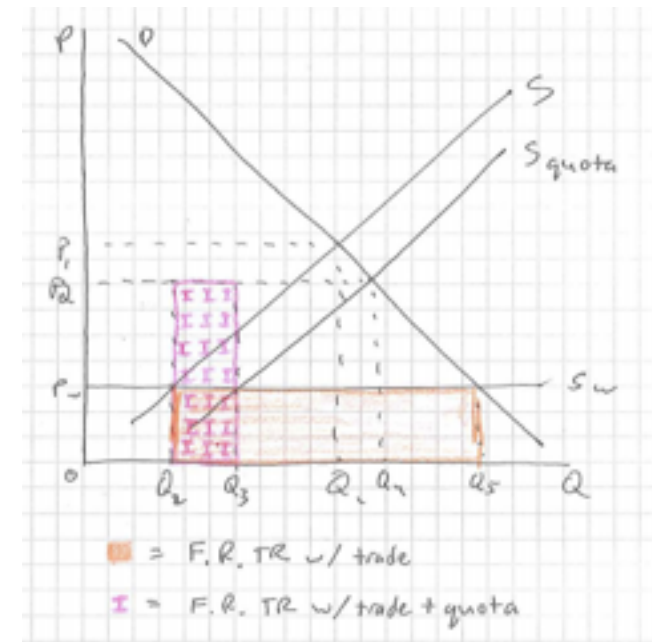
International Economics: Quotas



1. Domestic TR
2. World (foreign) TR



1. Domestic TR with trade
2. Domestic TR with trade and quota



1. Foreign TR with trade
2. Foreign TR with trade and quota

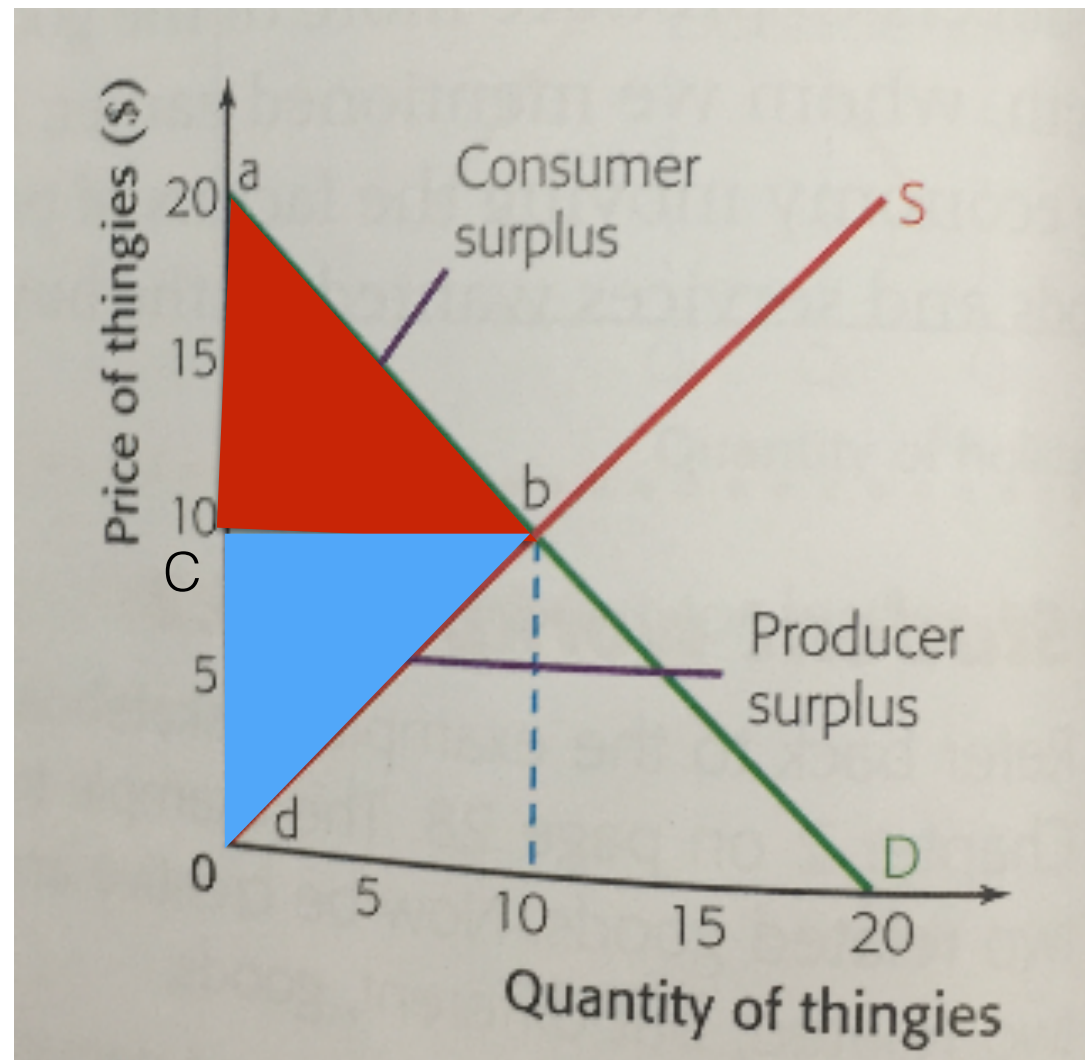


Triangle

$$\textit{Area} = 0.5 \times \textit{base} \times \textit{height}$$

Microeconomics

Community Surplus

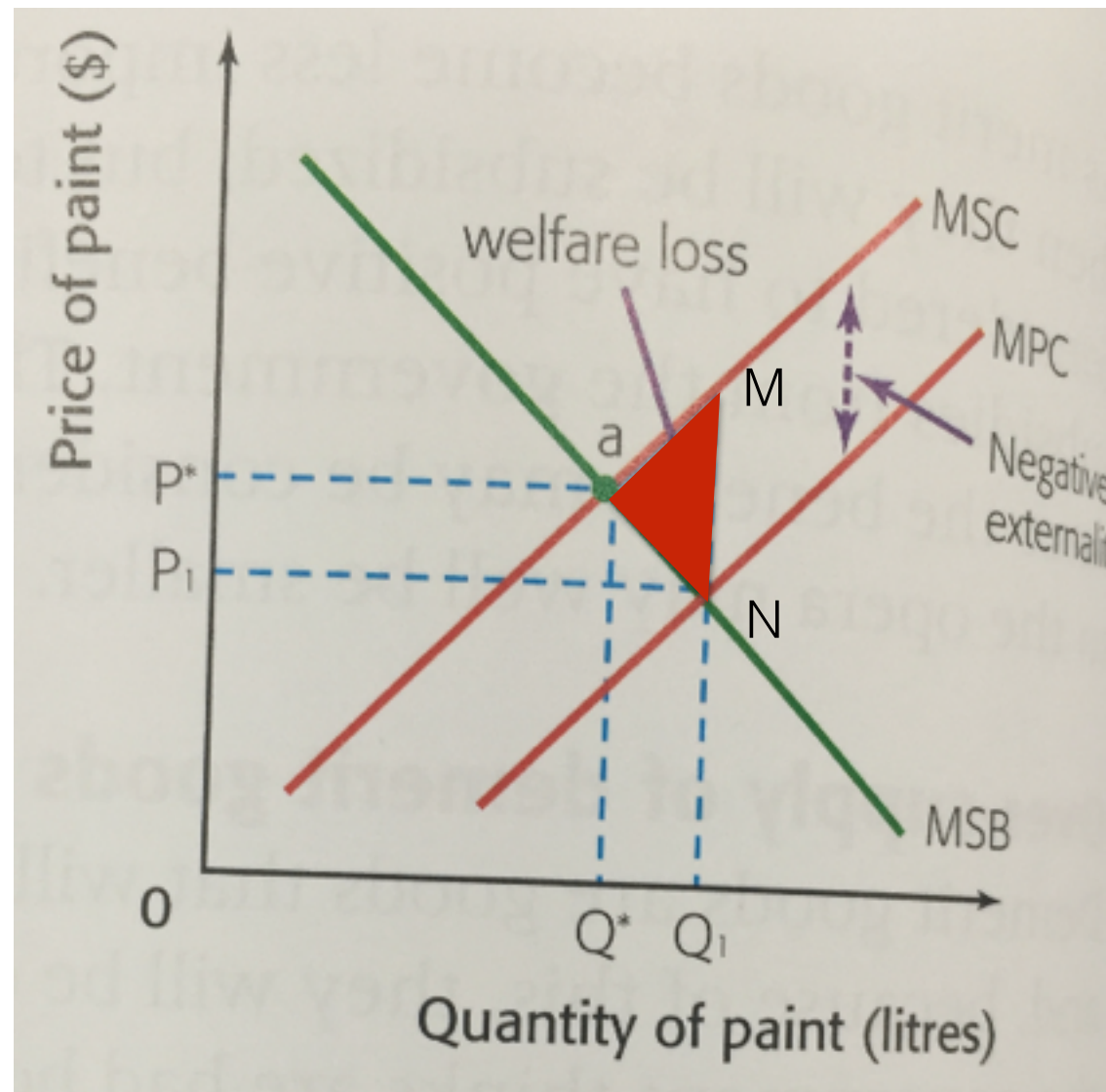


 a, b, c = consumer surplus  c, b, d = producer surplus

$$\text{Area 1} = 0.5 \times 10 \times 10$$

$$\text{Area 2} = 0.5 \times 10 \times 10$$

Market Failure

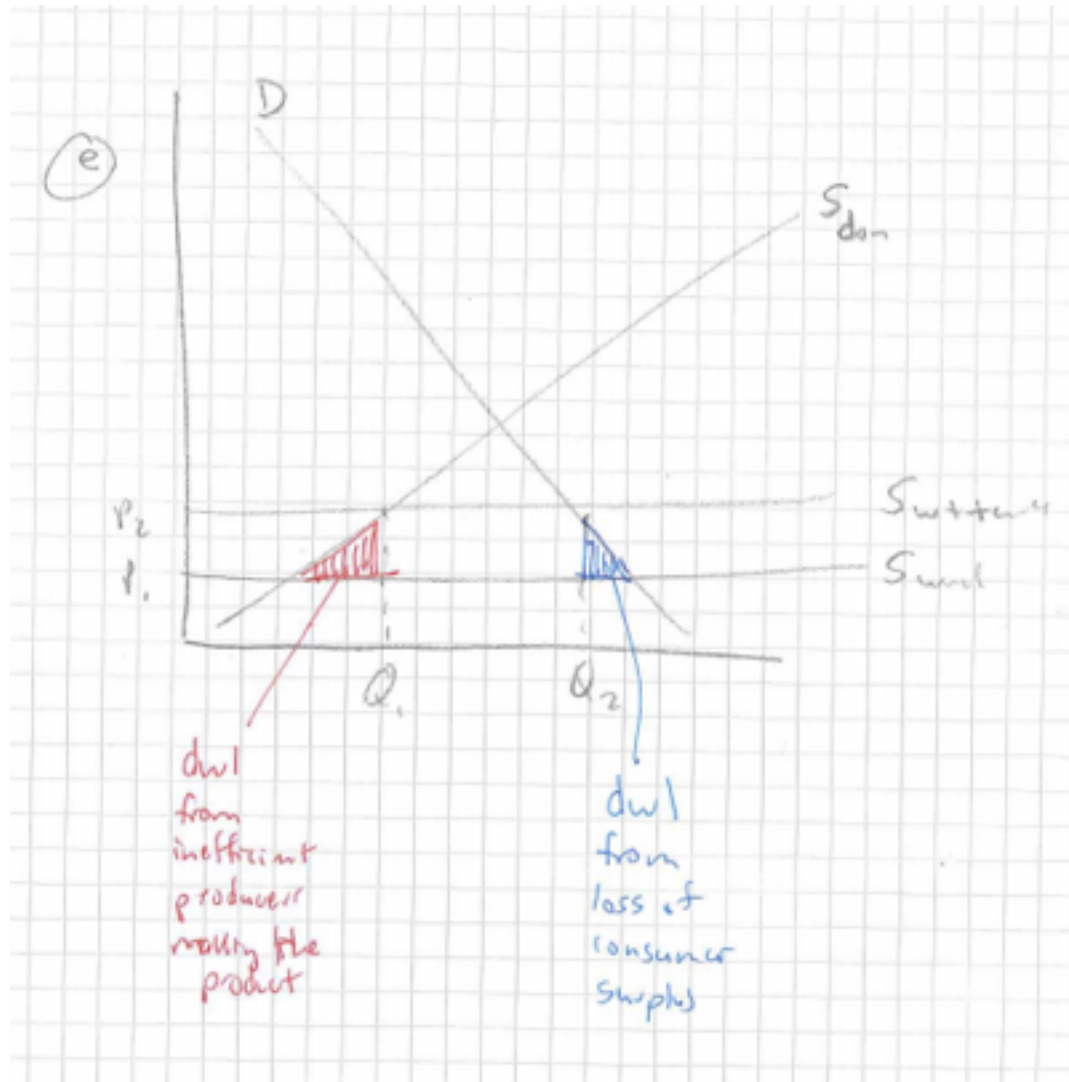


$a, M, N = \text{welfare loss}$

$$\text{Area} = (Q_1 - Q^*) \times (P^* - P_1)$$

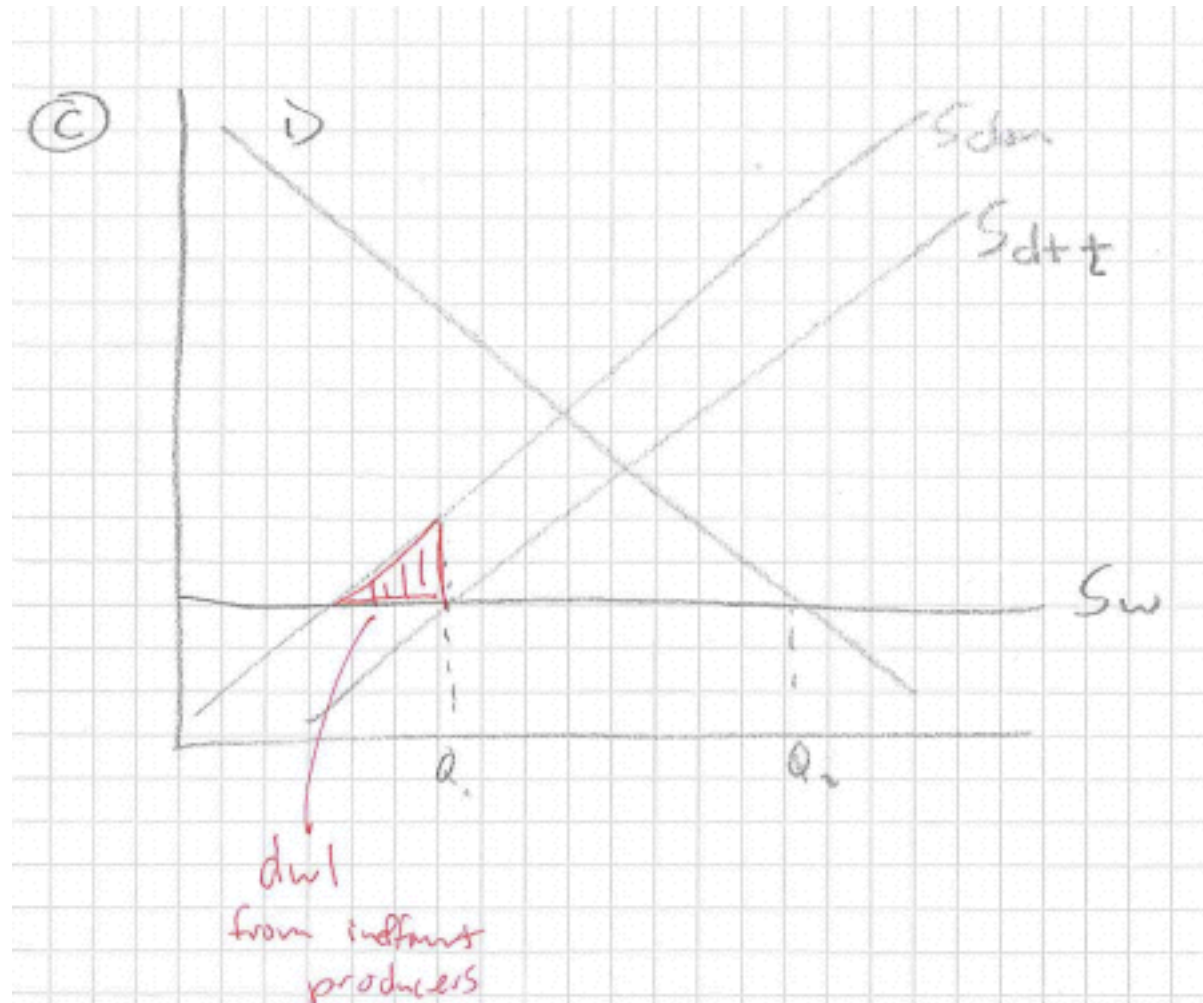
International Trade

International Economics: Tariffs



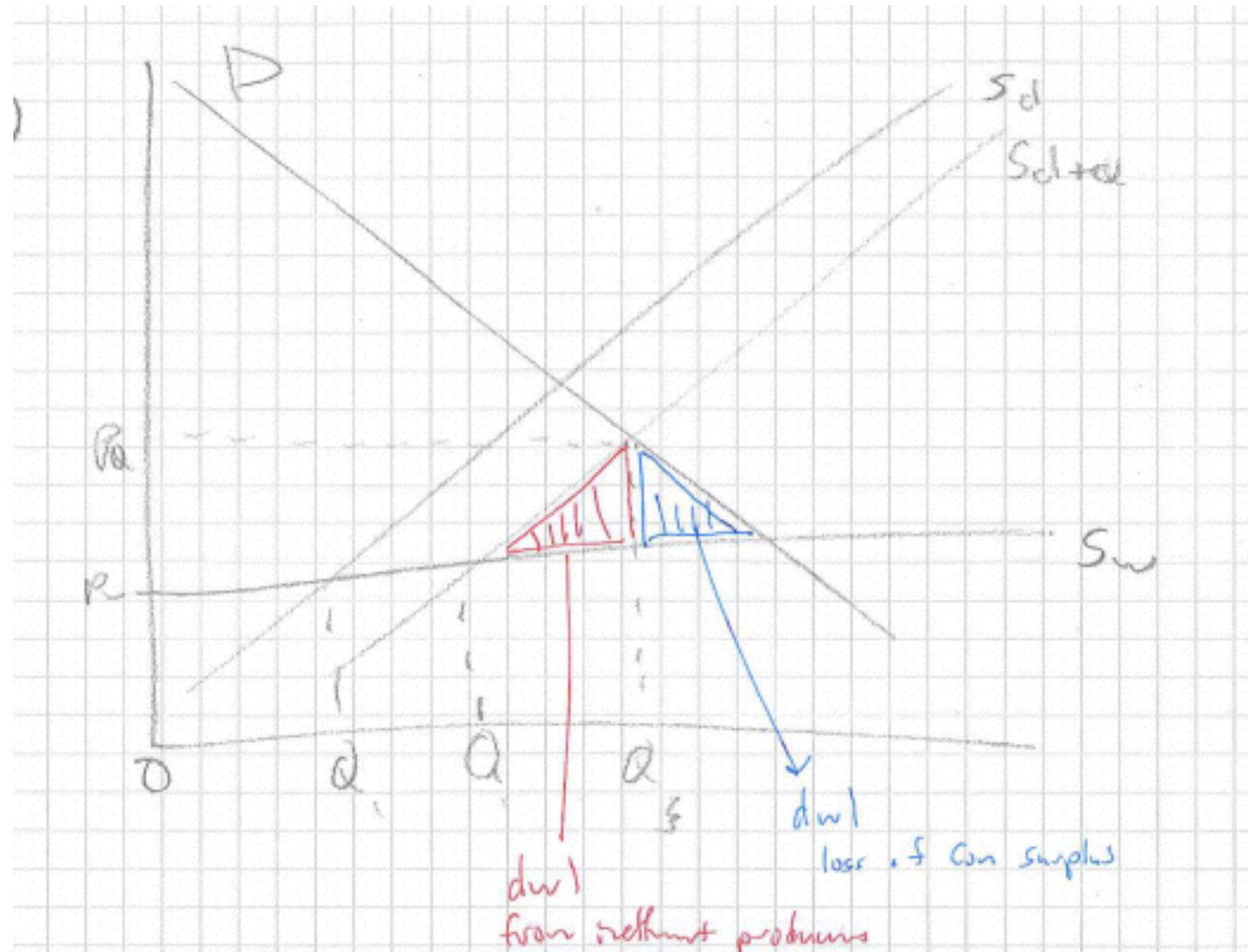
1. Dead-weight loss of welfare from inefficient producers
2. Dead-weight loss of welfare from loss of consumer surplus

International Economics: Subsidies

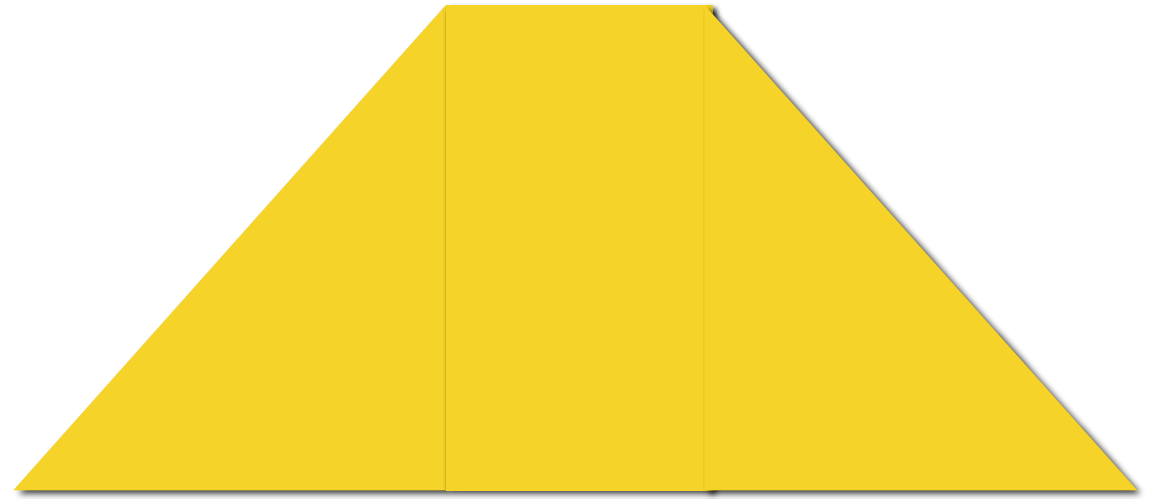


1. Dead-weight loss of welfare from inefficient producers

International Economics: Quotas



1. Dead-weight loss of welfare from inefficient producers
2. Dead-weight loss of welfare from loss of consumer surplus



Trapezoid

$$\text{Area} = 0.5 \times (\text{upper length} + \text{bottom length}) \times \text{height}$$

International Trade

Quota

HL Example 5

Assume that a quota is imposed on imports of good X. Answer the following questions using the information in the diagram below.

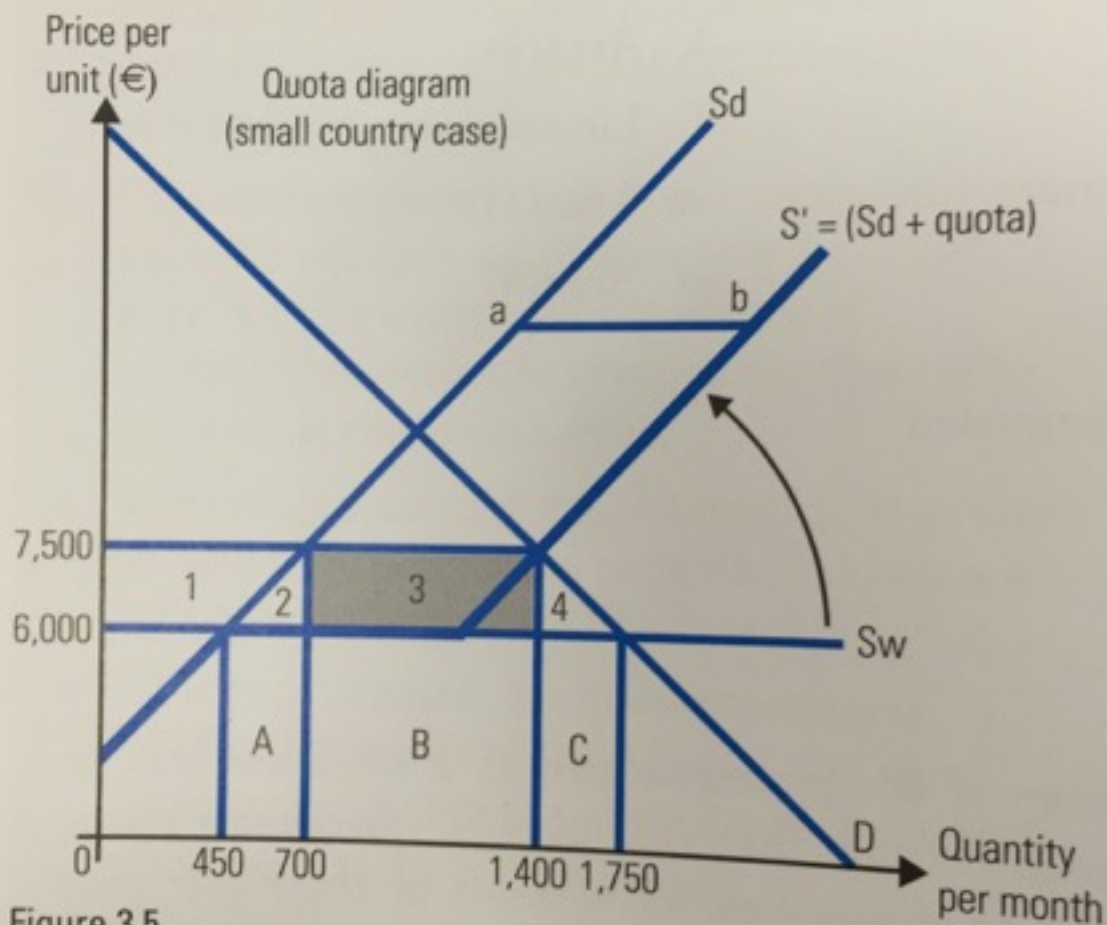


Figure 3.5

10 Calculate the resulting decrease in the consumer surplus.

Consumer surplus will have decreased by area (1 + 2 + 3 + 4) which is a trapezium (trapezoid).

The area of a trapezium is $\frac{B + b}{2} \times h$,

so $\frac{(1,750 + 1,400)}{2} \times 1,500$

= €2,362,500 (per month).

11 Calculate the resulting increase in the producer surplus.

This is area (1): $\frac{(700 + 450)}{2} \times 1,500$

= €862,500 (per month).